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PREDICTION OF OFFICER BEHAVIOR IN A SIMULATED COMBAT SITUATION

William H. Helme, Louis P. Willemin

and

Frances C. Grafton

LEADERSHIP PERFORMANCE TECHNICAL AREA



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U. S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

An activity of the Chief, Research and Development

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FOREWORD

Early identification of officer leaders and development of officer leadership from cadet training through company and field grade assignments are of major concern in the management of the Army's manpower resources. The U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) conducts research to provide scientific means of identifying individuals with good leadership potential for officer training, selecting officers for commissioning, and evaluating their performance.

OFFICER PREDICTION research was undertaken by the Institute to meet the need for improving the selection and assignment of personnel in accord with their capabilities to meet differing leadership requirements. The program evolved responsive to requirements and recommendations of the Army Scientific Advisory Panel and the Deputy Chief of Staff for Personnel. Objectives of the research are 1) clearer definition of the behavior demands of officers in different assignments and of the behavior which makes for success in those assignments, and 2) improved methods of identifying officers who can be expected to perform well in each of several broad domains of leadership. Analysis of duties performed by officers pointed initially to three groups of officer assignments--combat, technical, and administrative--which appeared to call for different patterns of leader behavior. *

The basic research design was longitudinal. Experimental measures were obtained on officers immediately after their entry on active duty, and performance evaluations were obtained at subsequent points in the officers' careers. The Differential Officer Battery (DOB), an extensive set of experimental tests developed and refined for differential prediction of broad domains of leadership, was administered to two samples of officers entering on active duty, the first sample of 6500 in 1958 and 1959, the second of about 4000 in 1961 and 1962. From the sample of 4000, 900 officers were selected as representative of various branches of service to take part in an experimentally controlled three-day exercise at the Officer Evaluation Center (OEC) established for the purpose at Fort McClellan, Alabama. The problem situations in the exercise yielded objective recorded data on specific details of each officer's performance, as well as judgmental evaluations of his style of behavior and effectiveness in aspects of each task and in each situation.

In addition to the evaluations obtained at the OEC, ratings of all officers who had taken the DOB were obtained. The first field rating was made by superiors and associates after the officers had been in their duty assignments for 12-18 months. In 1967 and 1968, evaluations of performance were obtained for officers of the original sample on duty in Vietnam (combat) and in combat-ready situations (Europe, Korea, CONUS).

A series of publications marks the culmination of the OFFICER PREDICTION research program--and, in fact, the impact of the findings on the ARI's ongoing and newly formulated programs on officer evaluation and career development. Technical Research Report 1173 presented the major psychological factors derived from officer responses to tests of the experimental Differential Officer Battery and described the reduction of the measures obtained to a manageable number of experimental predictor scores. A companion publication (Technical Research Report 1172) presented the important dimensions of officer leadership behavior derived from analysis of the specific actions recorded and observed or evaluated during the OEC simulation. Research Report 1182 examines the initial hypothesis of differential prediction as tested by the extent to which DOB scores are associated with differential performance in the OEC exercise and success in combat and technical/administrative assignments. Subsequent publications will deal with the prediction of officer performance as evaluated in duty assignments, including those in combat and

combat-ready environments. The analyses reported in these publications are the basis on which psychological instruments have been selected for operational introduction in officer training programs and evaluation at early career points. These analyses are expected to provide assessment not only of the usefulness of the DOB measures but also of the effectiveness of the various methods of performance evaluation by which the criterion data were obtained.



J. E. UHLAUER
Technical Director

PREDICTION OF OFFICER BEHAVIOR IN A SIMULATED COMBAT SITUATION

BRIEF

Requirement:

To develop measures predictive of officer performance in combat and technical/administrative duties for use in early career management decisions and early career counseling and personal career choices.

Procedure:

Factor scores on the Differential Officer Battery representing major dimensions of officer characteristics were correlated with two sets of factor scores representing officer performance in a 15-task exercise in a simulated combat environment. One set consisted of 30 task-specific scores, the other of 8 factor scores on major cross-situational dimensions of officer leader behavior exhibited in the OEC exercise.

Findings:

Two major dimensions of leadership--combat and technical/managerial--were clearly differentiated in the range of functional tasks constituting the simulated combat exercise.

Officer characteristics as measured by the Differential Officer Battery were found to be differentially predictive of officer behavior in situations representative of the two major leadership dimensions.

Utilization of Findings:

General application of these findings rests in the more effective assignment of officers to appropriate early training and initial duty tours, and in providing assessments of the career potential of cadets or junior officers--assessments which can be useful at early career decision points, specifically, entry to advanced ROTC, RA commissioning, branch choice, early assignment, and selection of secondary skills.

Predictive and evaluative techniques developed are well suited to application in the comprehensive new (proposed) Officer Personnel Management System in providing means of development of an appropriate primary and secondary skill for each officer and, at middle grade levels, of differentiation of career direction into command and technical/administrative progression.

PREDICTION OF OFFICER BEHAVIOR IN A SIMULATED COMBAT SITUATION

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PREDICTION OF OFFICER BEHAVIOR IN A SIMULATED COMBAT SITUATION

OBJECTIVES

Military leadership of the 70's faces new challenges. Accelerated progress in military technology, changes in the skills and motivation present in enlisted manpower resources, dynamic concepts of the mission of the armed forces--all these have brought about increasing diversity and complexity in command responsibilities. Increasingly effective personnel management tools are required to enable the officer corps to keep pace with these changes.

A broadly conceived research program has been conducted by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to provide the Army with scientific means of identifying officers who have aptitudes and other characteristics to meet the differing demands for success in different leadership positions. The program, longitudinal in design, spanned the 60's in order to deal with the performance of the same officers at successive career stages. Results are being applied to meet four major research objectives formulated to improve effectiveness of the officer personnel system:

1. Provide military personnel management with scientific measurement procedures for identification of young men with high potential for military leadership.
2. Develop means of identifying cadets or young officers with potential for different military leadership careers, particularly in combat command as contrasted with technical/managerial direction.
3. Devise and validate methods of evaluating officer performance in first-tour assignments and also of estimating potential for higher and more demanding assignments.
4. Develop techniques to assess motivation for a military leadership career, and to enhance career motivation through appropriate early assignments.

THE RESEARCH PROGRAM

As a basis for determining whether methods could be developed to provide useful prediction of how well an officer would perform in different jobs, special evaluations of officer performance were essential. While ratings provide a substantial segment of the performance data built into the present research, no ratings of officer performance on the job could supply the kinds of data needed for the differential

analysis essential to the present question. Ratings could yield measures of performance only for the assignment in which the rated officer was serving. What was needed were measures of each man's performance in each of at least three different assignments.

Research considerations indicated that situational performance tests would be the most objective, reliable, and valid means of assessing the differential leadership of officers in the follow-up phase of the research. This type of performance measure, as contrasted with retrospective evaluations and work products, reproduces critical elements of the job, usually in miniature. Situational performance tests are, in effect, samples of the job. Since field observation and logical analysis of schedules for military occupational specialties (MOS) for officers had led to the hypothesis that psychological demands differ among combat, administrative, and technical jobs, situational tests corresponding to these three types of officer assignment were decided upon as the principal technique for follow-up evaluation. In addition to the differential aspect of performance, the situational problems offered the possibility of simulating some of the stresses of wartime operations.

Research Phases

Following exploratory investigation and planning, the research program was conducted in several phases. Officers were followed from entry on active duty through first tour assignment and service in an active combat (Vietnam) or combat-ready (Europe, Korea, Alaska) theater or in CONUS some five years after entry.

1. Psychological measures designed to be differentially predictive of performance in technical, administrative, and combat assignments were developed. The result was the Differential Officer Battery (DOB), which included measures of information ranging from military tactics and technology to physical sciences, social sciences, arts, sports, and other activities. The DOB also included biographical reports and self-description materials dealing with background, interests, and attitudes. One test presented military situations in motion-picture form in which leadership decisions were the required response. Three physical performance measures were included: grenade-type throw, endurance crawl, and two-hand coordination. The DOB was administered to large samples of lieutenants on entry on active duty.

2. Officers in the samples were rated on their performance in their first-tour duty assignment by both superiors and associates, who also gave their estimates of the officer's potential for different and more demanding assignments.

3. A sample of officers who had taken the DOB participated as examinees in a set of situational criterion tasks designed to reflect activities performed by officers in combat, technical, and administrative jobs. The Officer Evaluation Center (OEC) was established at Fort McClellan as headquarters for an integrated test exercise administered in

a simulated MAAG setting. Records and evaluations of the behavior exhibited by each officer in the test situation were obtained. Over 2,000 items of data resulting from the exercise have been analyzed and reduced to reliable and fairly homogeneous scales. The present publication deals in detail with prediction of OEC performance analyzed in terms of well-defined dimensions of leadership behavior.

4. Officers in the sample who were on duty in Vietnam and in other locations including Germany and CONUS in 1967-68 were rated on performance.

5. Through analysis of relationships between the several test predictors and performance measures, predictor measures were identified which the Army can adapt for operational use to assess the leadership potential of newly commissioned officers.

ANALYSIS: DOB SCORES VS OEC PERFORMANCE

The DOB, administered to a sample of approximately 4,000 newly commissioned officers, was designed to yield measures differentiating leadership potential in three domains--combat, technical, and administrative. The OEC simulation exercise, in which 900 of the 4,000 officers went through a simulated combat exercise, was designed to provide an objective measure of leadership performance within which differentiable dimensions of leadership behavior could be defined and the DOB measures predicting these dimensions could be identified. As with the DOB, the OEC simulation was constructed to evaluate performance in the combat, technical, and administrative domains. Each domain was represented by five problem situations. The 15 situations were integrated into an intensive three-day sequence in the setting of a full combat activity in a realistic context but one unfamiliar to the participating officers--that of a Military Assistance Advisory Group (MAAG) in a friendly foreign country suddenly attacked by an aggressor force. Figures 1, 2, and 3 show a typical sequence of problem situations in the MAAG combat setting.

The psychological measures of the DOB consisted of information and knowledge tests, self-description and biographical questionnaires, judgments in military leadership situations presented on film, and physical proficiency measures. Analysis of these measures, reported elsewhere¹, provided 92 separate scores. The 92 scores were factor analyzed to define 17 basic dimensions (Figure 4).

The more than 2,000 observations, recordings, and evaluations of performance in the OEC simulation exercise were similarly analyzed.² Analysis yielded over 300 scores, which were further analyzed to define 30 factors

¹ Helme, W. H., L. P. Willemin, and Roberta W. Day. Psychological factors measured in the Differential Officer Battery. ARI Technical Research Report 1173. July 1971.

² Helme, W. H., L. P. Willemin, and Frances C. Grafton. Dimensions of leadership in a simulated combat situation. ARI Technical Research Report 1172. July 1971.

OFFICER EVALUATION CENTER SITUATIONAL TESTS

DAY ONE: MAAG Office--Peacetime

Time

0730 Inspect 3 MAAG vehicles for combat readiness;
(T) recommend or take actions to correct deficiencies
1030 Correct poor supply records of Host Nation Army
(A) unit; explain errors to unit's antagonistic CO
1330 Check for bugs in commo network display for visit
(T) of Host Nation VIP; recommend or make corrections
1630 Supper
1745 Evaluate report on personnel ofc of Host Nation
(A) Army unit; recommend changes in orgn & work flow
1945 Study production records of Host Nation ordnance
(A) platoon; reschedule work assignments of repairmen
2230 To BOQ

HOST NATION INVADED
WITH NUCLEAR STRIKES

Figure 1. First day's activities in Officer Evaluation Center (OEC)

DAY TWO: MAAG Office--Wartime

0300 By radio, direct 4 jeep-mounted survey teams on
(T) Host Nation terrain reporting road damage, radiation levels, & other conditions
1200 Evaluate captured foreign weapon brought back by
(T) one of survey teams
1330 Study Host Nation map to select new depot sites;
(A) defend selections of depot sites made by MAAG CO
1630 On map, select new highway net to carry materiel
(A) from chosen depot sites to forward supply points
1900 Evaluate potential hasty airstrip sites & compute
(T) runway length
2000 To BOQ

SITUATION
DETERIORATES

Figure 2. Second day's activities in Officer Evaluation Center (OEC)

DAY THREE: Guerrilla Operations

0030 Evacuate MAAG Hq Office; trucked to woods; 5-mile
night-march through woods to MAAG Field CP
0330 in bunker, prepare Company March Order to move
(C) friendly guerrilla unit
0700 Prepare roadblock, first instructing NCOs in
(C) placing demolitions on trees to form abatis
0900 With NCOs (one is unmanageable), recon Helicopter
(C) LZ & plan deployment of platoon in its defense
1000 From prepared Observation Post, report enemy
(C) activities and potential targets
1100 Lunch
1130 Lead route recon patrol in jeep; captured, inter-
(C) rogated, released, & returned to US control
1430 CEASEFIRE: FOREIGN NATIONALS LEAVE HOST NATION

Figure 3. Third day's activities in Officer Evaluation Center (OEC)



Length of bar indicates relative importance of factors derived from analysis of DOB.

Figure 4. Factors of officer characteristics measured in Differential Officer Battery (DOB)

largely specific to particular situational tasks (Figure 5), and 8 factors of actual performance which were present across a number of different situations (Figure 6). The two most important of these eight leadership behavior factors--combat leadership and technical-managerial leadership--were clearly differentiated as separate independent domains of behavior.

The present analysis addresses the question: How well can the psychological measures of the DOB predict actual leadership behavior in the OEC simulation exercise? What relationships are found between the measured characteristics of officers on entry to active duty and the style and effectiveness of their leadership in the 15 challenging situational problems of combat, technical, and administrative content? In particular, can psychological measures predict leadership behavior differentially to indicate whether a given officer will perform better in a position of combat command or in a leadership role in an administrative or technical service?

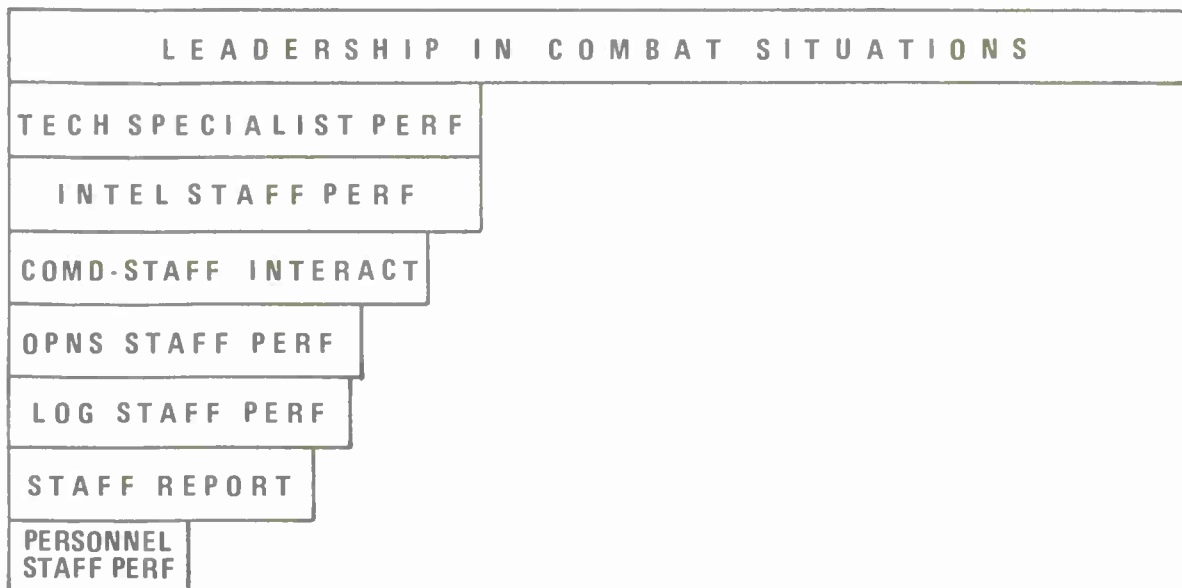
FINDINGS

Details of relationships between DOB scales and factor scores on the one hand, and OEC behavioral scores and factor scores on the other, are presented in the Technical Supplement. Major aspects of these relationships are given here.

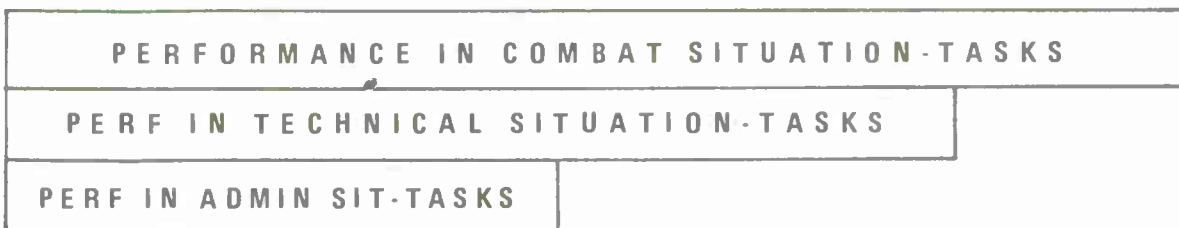
The most fundamental findings of DOB/OEC relationships concern the correlation between the major factors across the two kinds of measures or evaluations: 1) DOB factors of the psychological and personal characteristics of officers and 2) leadership behavior factors of officer performance in the OEC. Since the DOB was administered at time of entry on active duty or soon after and the OEC exercise was conducted after the officers had been on active duty from one to two years, the DOB measures were examined for their effectiveness in predicting leadership performance following branch basic school training and a year or more of first tour active duty experience.

How well did the major dimensions of leader characteristics from the DOB predict leadership behavior on the situation-related performance factors evaluated in the OEC? For this analysis, measures of performance in the OEC situations were grouped functionally according to kind of leadership required--combat command, staff activity, technical specialization, etc. In Figure 7, combat leadership potential measured at entry on active duty is seen to predict significantly leadership in OEC combat situations and intelligence staff functions. Measures of scientific potential and measures of general knowledge predict all general staff functions and technical specialist performance as well. Political orientation measures predict personnel staff performance only, and mechanical technology measures predict technical specialist functions only.

OEC Factor Sets Based on Command and Staff Functions



Sets of Factors Based on Types of OEC Tasks



NOTE: Length of bar indicates relative importance of each set of OEC tasks on which factors are based. The upper graph categorizes factors by military officer functions: combat command, staff, etc. The lower graph categorizes factors by the OEC tasks involved, the five combat, technical, and administrative tasks.

Figure 5. Factors of leadership behavior assessed in Officer Evaluation Center (OEC) situational tasks

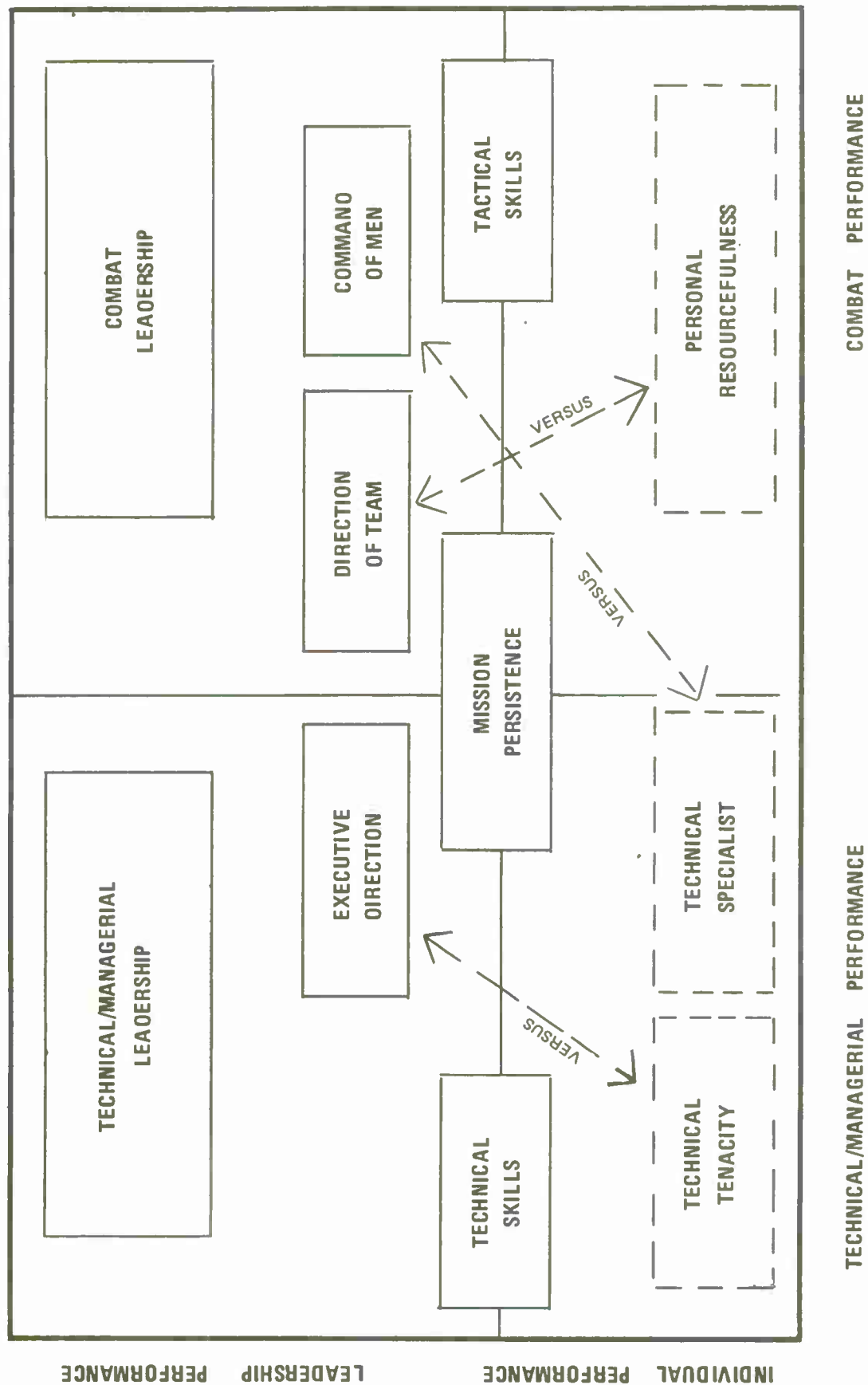
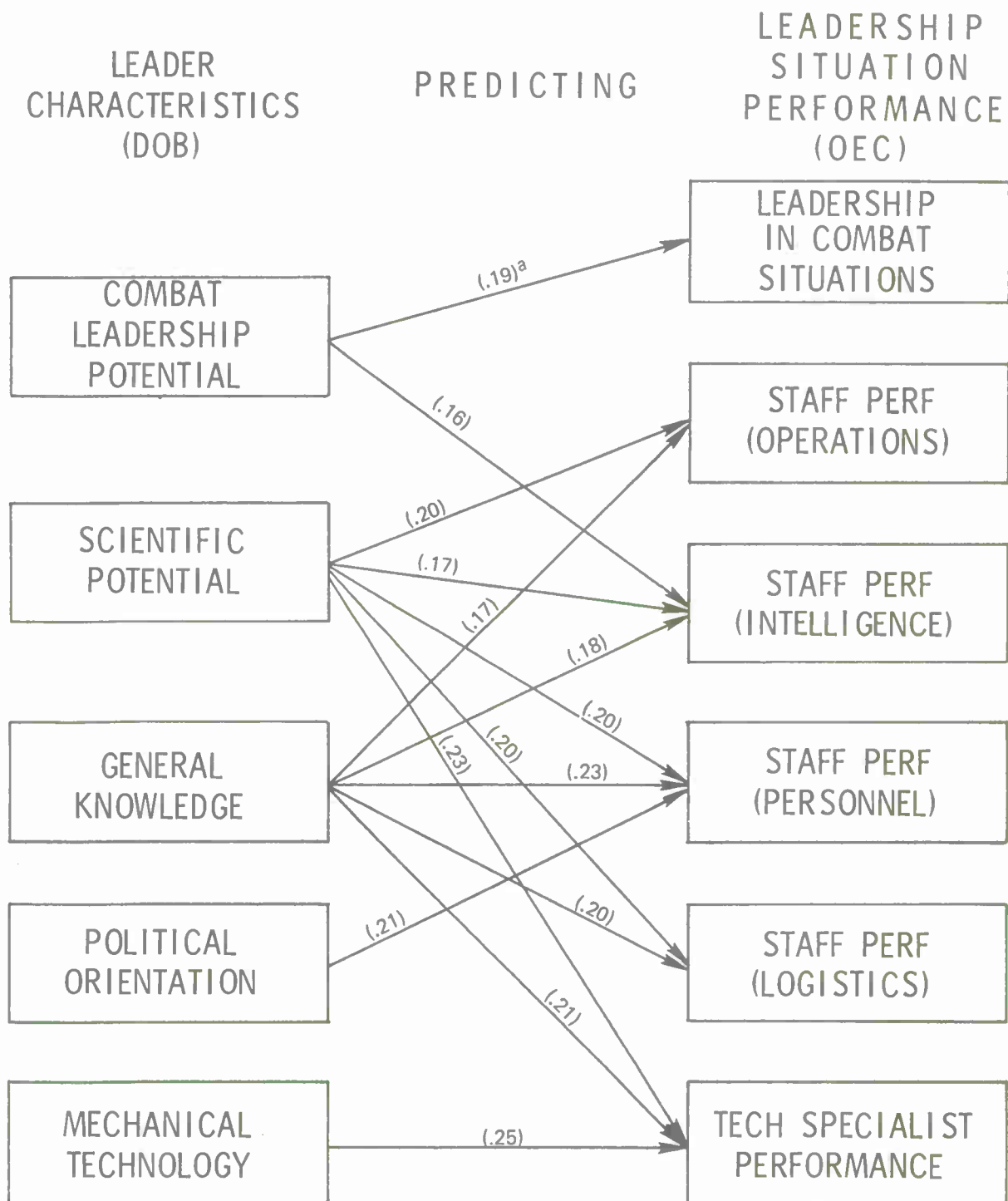


Figure 6. General factors of officer performance evaluated in simulated combat situation



^aCorrelation coefficients in parentheses were averaged from Tables 10 - 13.

Figure 7. Factors of leader characteristics (DOB) best predicting leadership performance in different kinds of OEC situations

Only the highly significant predictors are indicated in Figure 7. Thus, the fact that combat leadership potential predicts leadership behavior in combat situations and intelligence staff work but not in the other leadership areas indicates usefulness of the DOB for differential identification of officers for combat command. Conversely, scientific potential and general knowledge measures predict all the staff functions but not combat command. Political orientation predicts personnel staff performance, and mechanical technology predicts technical specialist functions uniquely.

While all the predictions cited above are highly significant statistically, the level of prediction is modest³. All these OEC factors of performance were specific to particular tasks, however. When prediction of OEC performance factors of a broader nature were investigated--factors each of which is found in several different OEC situations or tasks--the results were more striking. Figure 8 shows that broad combat leadership performance (OEC) was best predicted by the score on the combat leadership factor of the DOB, which also predicted the OEC mission persistence factor quite well⁴. DOB scientific potential and general knowledge factors predicted technical/managerial leadership, tactical skills and technical skills quite well⁵, and mechanical technology was predictive of technical skills at a substantial level⁶. Some moderately effective predictors of combat leadership are also shown to indicate other minor indicators of this key behavioral domain.

These results demonstrate that the two most important domains of leadership behavior--combat and technical/managerial--can be predicted differentially. In other words, it is possible to use such instruments as those of the DOB as indicators of the relative strength of an officer's potential for leadership in such different domains as combat command and technical/managerial, as well as the absolute level of each potential.

APPLICATION OF FINDINGS

The principal findings from the research phases so far completed are 1) that leadership behaviors in meeting the demands of a wide variety of officer functional tasks in a simulated combat situation are clearly differentiated into two major domains--combat leadership and technical-managerial leadership--and 2) that these behaviors can be differentially predicted by psychological assessment techniques administered to the officers one to two years earlier. Two major areas of application suggest themselves: First, officers whose behavior is differentially effective

³ Correlation coefficients ranged from .16 to .25.

⁴ Correlation coefficients were as follows: DOB combat leadership scale vs OEC combat performance, $r = .36$; DOB combat leadership scale vs OEC mission persistence, $r = .22$.

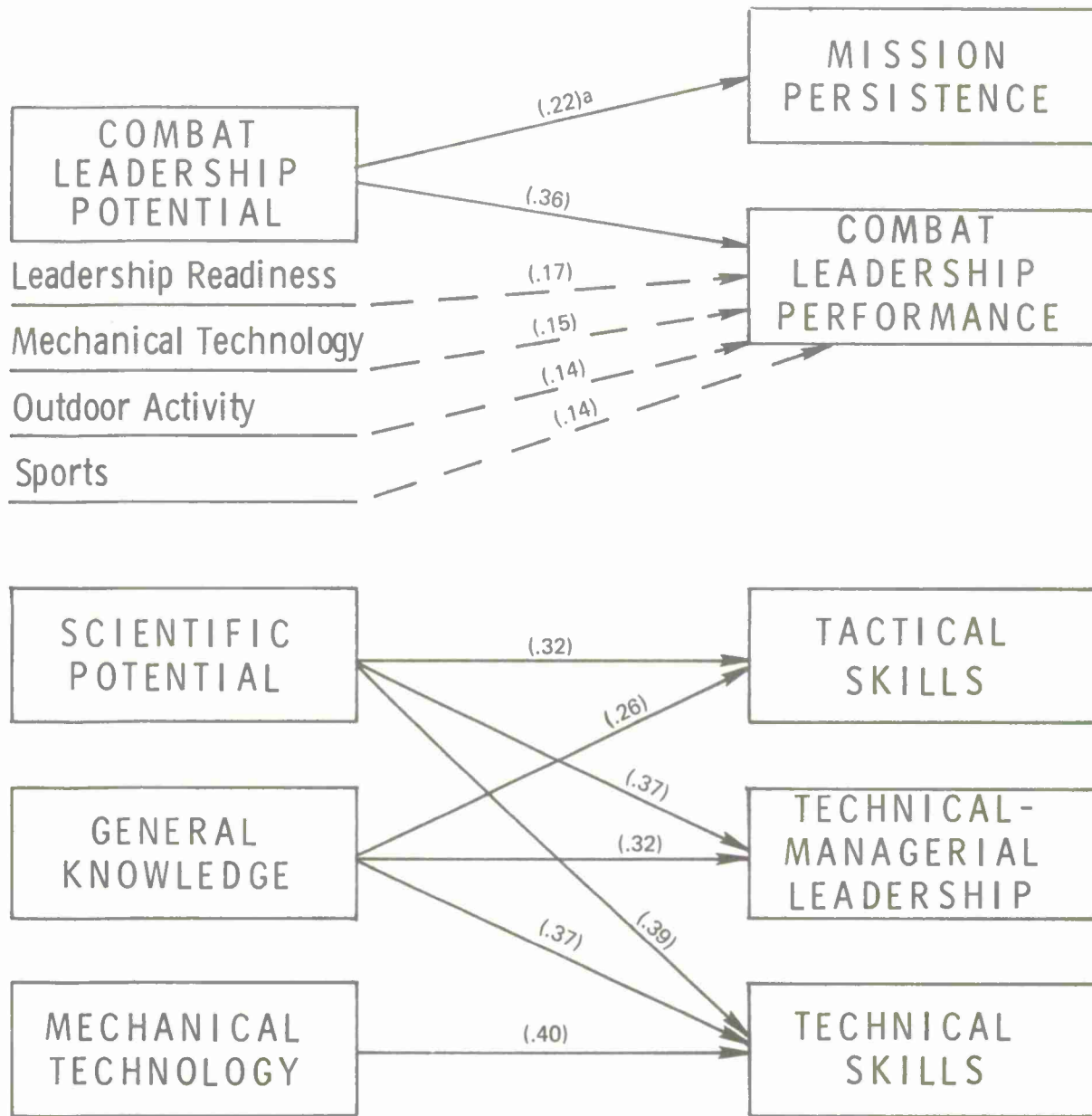
⁵ Correlation coefficients ranged from .26 to .39.

⁶ DOB mechanical technology vs OEC technical skills, $r = .40$.

LEADER CHARACTERISTICS (DOB)

PREDICT

LEADERSHIP BEHAVIORS (OEC)



^aCorrelation coefficients in parentheses were taken from Table 8.

Figure 8. Factors of leader characteristics (DOB) best predicting leadership behaviors across OEC tasks

in the two domains can be more effectively employed by assignment to their better domain, and second, the career potential of cadets or junior officers can be assessed during training, using psychological techniques that provide information for early decision-points: entry to advanced ROTC, RA commissioning, branch choice, and early school selection and duty assignments. Early identification of the most promising career officer leaders and their career directions can be indicated.

As findings have been emerging from this research, the Army through the Office of the Deputy Chief of Staff for Personnel, has developed and proposed a comprehensive new Officer Personnel Management System (OPMS)². The findings here provide research support for major features of OPMS, providing for 1) identification and development of both a primary branch-related and a secondary skill area for each officer, and 2) differentiation of careers at middle field-grade levels into command, functional, and specialist career programs of assignment and advanced schooling. Thus, whatever changes in Army career management are adopted, it is evident that techniques developed from current findings and from subsequent research efforts will be applicable to provide information for decisions by both management and individual officers at key career points.

² Department of the Army, The Officer Personnel Management System, 25 June 1971, as amended and approved in concept by CSA 5 January 1972.

TECHNICAL SUPPLEMENT

ANALYSIS OF RELATIONSHIP OF DOB PREDICTORS TO OEC PERFORMANCE

SUMMARY OF STEPS IN ANALYSIS

Relationships between DOB predictors and the OEC observations and evaluations were analyzed by the following steps:

1. Tetrachoric correlation coefficients of 91 DOB scales with 266 OEC variables were computed. To conserve computer space, one DOB variable correlating .87 with another was omitted, and OEC variables with meagre variance or extremely high correlation with others were deleted.

2. Unit-weighted composites of OEC variables yielding estimates of 30 behavioral factors of the OEC (28 of them confined to single situation tasks) were defined. These 30 factors had been derived in earlier analyses⁸.

3. Unit-weighted composites of OEC variables yielding estimates of 8 cross-situational OEC factors were similarly determined. These factors also had been derived in earlier analyses⁹.

4. Unit-weighted composites of DOB variables yielding estimates of 17 DOB factors were similarly determined⁹.

5. Correlation between DOB and OEC factors was computed as follows, using correlation of sums:

17 DOB factors versus 8 cross-situational OEC factors

17 DOB factors versus 30 OEC task-oriented factors

91 DOB variables versus the 8 and the 30 OEC factors

17 DOB factors and 91 DOB variables versus the 15 total task scores. These total task scores were obtained from task variables weighted by judgment of the OEC team of military experts.

⁸ Helme, W. H., L. P. Willemin, and Frances C. Grafton. Dimensions of leadership in a simulated combat situation. ARI Technical Research Report 1172. July 1971.

⁹ Helme, W. H., L. P. Willemin, and Roberta W. Day. Psychological factors measured in the Differential Officer Battery. ARI Technical Research Report 1173. July 1971.

OBTAINING DOB AND OEC FACTOR SCORES

Loadings of defining variables of the 17 DOB factors are presented in Table 1. Loadings of the variables on the 30-factor set from the OEC are shown in Table 2. Loadings of principal variables defining the 8 cross-situational factors of the OEC appear in Table 3.

The set of composites of unit-weighted DOB variables and the resulting correlation coefficients obtained with DOB factors are given in Table 4. Table 5 shows similar data for the 30 OEC factors. Of these 30 factors, 15 correlated substantially with total scores on the corresponding situational tasks. These total scores had not been included in the original factor analysis¹⁰. Table 6 shows the factor-total-score correlation. Table 7 presents the unit-weighted composites and correlation coefficients for the 8 cross-situational OEC factors.

Range of factor-prediction correlation coefficients and median correlation coefficients were as follows:

<u>Factor Set</u>	<u>No. of Variables</u>	<u>Range of r's</u>	<u>Median</u>
17 DOB	3 to 6	.41 to .89	.82
30 OEC	1 to 4	.49 to .93	.81
8 OEC	3 to 9	.82 to .99 +	.95

PREDICTING CROSS-SITUATIONAL OEC FACTOR SCORES

Table 8 presents prediction of the eight cross-situational OEC leadership behavior factors from factors of the DOB. Selected data from this table were presented in Figure 8 in the body of this report and discussed under "Findings." Predictive validity confirmed the factor constructs in the two domains. Science and General Knowledge were the best predictors of the problem-solving and organizing involved in Technical-Managerial Leadership; Combat Leader potential was the best predictor of Combat Leadership performance in the OEC. With minor differences, DOB factors predicted Tactical Skills in the same pattern as they predicted Technical-Managerial Leadership, these combat staff and communications skills apparently requiring the same reasoning and organizing abilities as the technical-managerial functions. For Technical Skills, however, the DOB Mechanical Technology factor was the best predictor, closely followed by Science and General Knowledge. Other OEC cross-situational factors were poorly predicted, although Combat Leader potential had a validity of .22 for Mission Persistence. Among the statistically-significant but modest validity coefficients were Political Orientation and Leadership Readiness for Technical-Managerial Leadership; Leadership Readiness, Mechanical Technology, Outdoor Activity, and Sports for

¹⁰ One exception was Road Damage and Radiation Survey in which the Overall Effectiveness Rating was used as the total score.

Table 1

FACTORS MEASURED IN DIFFERENTIAL OFFICER BATTERY

<u>I. Mechanical Technology</u>		<u>IX. Leadership Readiness</u>	
Mechanical Orientation	.83	Ready Decision-Making	.61
Mechanical Interest	.82	Readiness to Lead	.59
Manual Crafts Interest	.67	Resistance to Mediator Role	.48
Manual Skill and Interest	.60		
Diagram Interpretation	.57	<u>X. Supervision</u>	
Practical Skills Information	.51	Active Supervision	.77
		Administrative Supervision	.74
		Administrative Interest	.41
<u>II. Combat Leadership</u>		<u>XI. Science</u>	
Outdoor Skill and Combat Leadership	.77	Scientific Interest	.85
Combat Interest	.73	Math-Science Skill and Interest	.79
Manual vs White-Collar Interest	.66	Scientific Orientation	.78
Combat Leader Orientation	.64	Math-Physical Science Information	.76
Nature Endurance	.57	Diagram Interpretation	.59
Physical Leadership	.55	Capacity for Detail	.50
<u>III. Administration</u>		<u>XII. Aesthetic-Intellectual</u>	
Finance Information	.68	Aesthetic Interest	.64
Business Skill and Interest	.67	Aesthetics-Intellectual Orientation	.51
Administrative Interest	.66	Language Skill and Interest	.44
Administration Orientation	.60		
Administrator Interest	.56	<u>XIII. Authority and Structure</u>	
<u>IV. General Knowledge</u>		Concern for Order (1)	.38
Entertainment Information	.72	Concern for Order (2)	.36
History and Politics Information	.67	Achievement Need	.34
Medical and Chemical Information	.60		
Practical Skills Information	.51	<u>XIV. Easygoingness</u>	
Technical Operations Information	.50	Easygoingness	.53
Supply Information	.50	Easygoing Disposition	.40
<u>V. Outdoor Activity</u>		Non-Concern for Order	.31
Rural vs Urban Background	.65		
Outdoor Interest	.58	<u>XV. Strict Command</u>	
Frontiersman Orientation	.39	Strict Combat Discipline	.40
<u>VI. Personal Adjustment</u>		"Taut Ship" Command	.39
Freedom from Neurosis	.73	Command Responsibility	.36
Freedom from Anomie	.70		
Emotional Control	.69	<u>XVI. Political Orientation</u>	
Healthy Self-Acceptance	.68	History and Politics Information	.34
Frustration Tolerance	.54	Political Science Skill and Interest	.33
<u>VII. Sports</u>		<u>XVII. Managerial Leadership</u>	
Athletic Interest	.79	Verbal-Social Leadership	.70
Sports Interest	.76	Decisive Leadership	.69
Kneeling Basketball Throw	.64	Strict Discipline	.60
Organized Sports Information	.48	Administrative Leadership	.54
<u>VIII. Social-Economic Advantage</u>			
Economic-Cultural Level	.74		
Social Advantage	.70		

Table 2

OEC PERFORMANCE VARIABLES LOADING HIGHEST
ON THIRTY SITUATIONAL FACTORS

Code	Performance Variable	Loading
<u>Factor I: Security Mission</u>		
KCAR	Rated overall combat aptitude	.91
KTTC	Effectiveness of total mission behavior	.91
KDHR	Rated decisive without haste	.87
KBAR	Rated bearing and assurance	.86
KGAF	General ability	.84
KMCF	Extent mission completed	.82
KEDP	Effectiveness of defense plan	.77
KCSR	Rated considerate within mission requirements	.76
KUMF	Understanding mission	.75
KBAF	Bearing and assurance	.75
KFHP	Firm handling of personnel	.72
<u>Factor II: Communications Exhibit</u>		
FMAF	Extent mission accomplished	.88
FURR	Rated use of reference manuals	.82
FCCD	Handling circuit defects	.79
FEQF	Familiarity with equipment	.78
FMOR	Rated motivation (effort)	.78
FAPR	Rated trouble-shooting approach	.77
FFIF	Following instructions	.75
FEQD	Handling equipment defects	.72
<u>Factor III: Roadblock</u>		
LCAR	Rated overall combat aptitude	.86
LBAR	Rated bearing and assurance	.84
LMOR	Rated motivation (effort)	.77
LDHR	Rated decisive without haste	.76
LOBR	Rated organization of mission briefing	.73
LFBR	Rated forcefulness of mission briefing	.71
LMOF	Motivation (effort)	.69
LDBR	Rated amount of detail in mission briefing	.66
LUMF	Understanding mission	.66

Table 2 continued

Code	Performance Variable	Loading
<u>Factor IV: Reconnaissance Patrol</u>		
MCAR	Rated overall combat aptitude	.89
MMOR	Rated motivation (effort)	.80
MDHR	Rated decisive without haste	.79
MMCF	Extent mission completed	.76
MCMF	Effective command	.71
MBAR	Rated bearing and assurance	.68
MMOF	Motivation (effort)	.67
MGAF	General ability	.66
<u>Factor V: Production Analysis</u>		
BRLR	Rated relevance of written report	.80
BADR	Rated overall administrative effectiveness	.73
BMCR	Rated language of written report	.63
BPUC	Written report: statement of purpose	.57
<u>Factor VI: Road Damage and Radiation Survey</u>		
JOER	Rated overall effectiveness in mission	.86
JMOR	Rated motivation (effort)	.80
JBAR	Rated bearing and assurance	.74
JMOF	Motivation (effort)	.72
JORR	Rated organization of mission briefing	.70
JATF	Attitude (cooperation)	.69
JDHR	Rated decisive without haste	.68
JLDR	Rated amount of detail in mission briefing	.66
JGAF	General ability	.66
JMCF	Extent mission completed	.66
<u>Factor VII: Road Damage and Radiation Survey</u>		
JFRY	Computing past radiation levels (II)	.82
JFEH	Computing past radiation levels (IV)	.80
JFRX	Computing past radiation levels (I)	.77
JFRZ	Computing past radiation levels (III)	.77
JFLH	Computing past radiation levels (V)	.74

Table 2 continued

Code	Performance Variable	Loading
<u>Factor VIII: Automotive Inspection</u>		
GMAF	Extent mission accomplished	.75
GURR	Rated use of reference manuals	.75
GMOR	Rated motivation (effort)	.71
GTRP	Defects appropriately treated	.71
GTDG	Defects accurately diagnosed	.68
GBAF	Bearing and assurance	.67
GAPR	Rated trouble-shooting approach	.66
GEQF	Familiarity with equipment	.66
<u>Factor IX (Cross-Task): Direction of Men vs. Self-Reliance</u>		
	<u>Task</u>	<u>Variable</u>
LSUT	Roadblock	Training and supervision of subordinates .55
JKCF	Road Damage & Radiation	Keeping cool .54
LOSS	Roadblock	Controlling on-site security .47
HMOR	Weapons Assessment	Rated motivation (effort) .40
OESF	March Order	Endurance and stamina -.63
<u>Factor X: Observation Post</u>		
NCAR	Rated overall combat aptitude	.75
NBAF	Bearing and assurance	.73
NMOR	Rated motivation (effort)	.68
NMCF	Extent mission completed	.62
NTTC	Effective mission behaviors	.60
NECF	Effective command	.53
NADS	Complete and accurate reporting target locations	.50
<u>Factor XI: Site Selection</u>		
DMOR	Rated motivation (effort)	.73
DBAF	Bearing and assurance	.68
DBAR	Rated bearing and assurance	.65
DMAF	Extent mission accomplished	.58
DEEF	Effective expression	.58
DUMR	Rated understanding mission	.57
DKCF	Keeping cool	.52

Table 2 continued

Code	Performance Variable	Loading
<u>Factor XII: Improper Supply Records</u>		
CSBR	Rated bearing and poise in stress briefing	.75
CSOR	Rated organization of stress briefing	.71
CSMR	Rated motivation in stress briefing	.70
CSFR	Rated fluency in stress briefing	.68
CSAR	Rated appropriate aggressiveness in stress briefing	.58
CSPR	Rated adherence to principles in stress briefing	.55
<u>Factor XIII: March Order</u>		
OMCF	Extent mission completed	.81
OMOR	Rated motivation (effort)	.77
OFIF	Following instructions	.68
OMOB	March order: basic unit	.58
OPLM	Planning later march units	.44
<u>Factor XIV: Highway Traffic Plan</u>		
EMAF	Extent mission accomplished	.76
EFIF	Following instructions	.70
ETTT	Tonnage delivered	.63
EMOR	Rated motivation (effort)	.61
EBAF	Bearing and assurance	.47
<u>Factor XV: Weapons Assessment</u>		
HMID	Supplementary reporting of identification clues	.71
HNUL	Basic reporting of identification clues	.68
HMED	Reporting mech details & other intelligence	.63
HMOR	Rated motivation (effort)	.46
<u>Factor XVI: Reconnaissance Patrol</u>		
MMAS	Maintaining security in PW interrogation	.78
MSCR	Rated self-control in PW interrogation	.71
MEAP	Avoiding pitfalls in PW interrogation	.62
<u>Factor XVII: Automotive Inspection</u>		
GCMF	Effective command	.81
GUPR	Rated utilization of personnel	.61
GBAF	Bearing and assurance	.41

Table 2 continued

Code	Performance Variable		Loading
<u>Factor XVIII: (Cross-Task) Combat vs. Technical Persistence</u>			
	<u>Task</u>	<u>Variable</u>	
KESF	Security Mission	Endurance and stamina	.64
JJOG	Road Damage & Radiation	Handling tactical emergency by radio	.42
JESF	Road Damage & Radiation	Endurance and stamina	.35
IUMR	Airfield Layout	Rated understanding mission	-.48
ERST	Highway Traffic	Concentration under stress	-.51
<u>Factor XIX: Improper Supply Records</u>			
CSCR	Rated tact and control in stress briefing		.83
CSXR	Rated appropriate flexibility in stress briefing		.80
CSAR	Rated appropriate aggressiveness in stress briefing		.43
<u>Factor XX: Road Damage and Radiation Survey</u>			
JCSR	Rated consideration within mission requirements		.49
JCOF	Consideration for men		.45
DKCF	(Site Select Task) Keeping cool		.43
JHAG	Terminating mission to save team		-.44
JTDC	Briefing team on road damage mission		-.46
<u>Factor XXI: March Order</u>			
ONEP	Noting enemy position		.63
OPES	Providing equipment and supplies		.61
OMCS	Maintaining contact and security		.50
OOME	Outlining mission and execution		.36
<u>Factor XXII: Production Analysis</u>			
BAVR	Rated conciseness of written report		.79
BSAR	Rated sentence adequacy in written report		-.78

Table 2 continued

Code	Performance Variable	Loading
<u>Factor XXIII: Airfield Layout</u>		
IUTT	Considering terrain features in site evaluation	.60
IRRT	Thoroughness of runway report	.59
ICOA	Accuracy of runway length computation	.56
INSE	Number of sites evaluated	.52
IOPH	Considering opnl hazards in site evaluation	.39
<u>Factor XXIV: Reconnaissance Patrol</u>		
MDER	Rated amount of detail in mission briefing	.66
MOER	Rated organization of mission briefing	.61
MFIB	Initial briefing on radio frequencies for mission	.56
MFER	Rated forcefulness of mission briefing	.52
MEEF	Effective expression	.42
<u>Factor XXV: Roadblock</u>		
LCOF	Consideration for men	.46
LGAF	General ability	.42
LBAF	Bearing and assurance	.39
LEEF	Effective expression	.39
LCTA	Tactical control	.37
MCCE	(Recon Patrol) Effectiveness in face of enemy	.37
<u>Factor XXVI: Reconnaissance Patrol</u>		
MCOF	Consideration for men	.54
MDWM	Disposition of wounded team members	.54
MCSR	Rated consideration within mission rqmts	.47
<u>Factor XXVII: Reconnaissance Patrol</u>		
MDCR	Rated amount of detail in debriefing CO after IPW	.55
MEND	Debriefing CO on main aspects of IPW exp	.49
MOCR	Rated organization of debriefing CO after IPW	.47
MFCR	Rated forcefulness of debriefing CO after IPW	.47
MKCF	Keeping cool	.36

Table 2 continued

Code	Performance Variable	Loading
<u>Factor XXVIII: Road Damage and Radiation Survey</u>		
JTRX	Recording reported radiation levels (I)	.54
JTRY	Recording reported radiation levels (II)	.39
<u>Factor XXIX: Site Selection</u>		
DFIF	Following instructions	.48
DMAF	Extent mission accomplished	.42
DCOM	Thoroughness in assigned task	.37
JTEH	(Road Damage & Radiation) Recording reported radiation levels (IV)	-.35
<u>Factor XXX: Office Management</u>		
ASQO	Sequencing work flow	.52
ARTP	Retaining effective work flow steps	.46

Table 3

FACTORS OF LEADERSHIP BEHAVIOR EVALUATED
IN OFFICER EVALUATION CENTER EXERCISE

Factor	Situation Task	Behavior Evaluated	r
TECHNICAL- MANAGERIAL LEADERSHIP	Production Analysis	Total task performance	.85
	Supply Records	Total task performance	.78
	Supply Records	Organization of stress briefing	.63
	Production Analysis	Written report content	.62
	March Order	Overall performance quality	.60
	Production Analysis	Ratings on written report	.59
	March Order	Directive for basic unit	.54
COMBAT LEADERSHIP	Observation Post	Sum of performance rating judgments	.77
	Security Mission	Total task performance	.75
	Security Mission	Understanding mission	.73
	Reconnaissance Patrol	Total task performance	.65
	Reconnaissance Patrol	Bearing and assurance	.65
	Security Mission	Considerate within mission requirements	.64
	Security Mission	Bearing and assurance	.63
	Observation Post	Total task performance	.61
TEAM LEADERSHIP ↓ versus	Roadblock	Confidence and forcefulness	.60
	Roadblock	Training and Supervision of Subordinates	.62
	Roadblock	Controlling on-site security	.51
	Roadblock	Total task performance	.45
	Roadblock	Understanding mission	.44
	Site Selection	Effective expression	.43
	Roadblock	Motivation (effort)	.43
	Site Selection	Understanding mission	.43
	Weapon Assessment	Motivation (effort)	.40
	Weapon Assessment	Motivation (effort)	.40
PERSONAL RESOURCE- FULNESS	March Order	Endurance and stamina	.64
	March Order	Effective military behavior	.63
	Reconnaissance Patrol	Aggress conduct in hands of enemy	.43
COMMAND OF MEN ↓ versus	Auto Inspection	Effective command	.47
	Reconnaissance Patrol	Effective command	.40
	Reconnaissance Patrol	Decisiveness without haste	.40
	Reconnaissance Patrol	Attitude (cooperation)	.39
	Reconnaissance Patrol	Initial briefing on mission	.37
	Reconnaissance Patrol	Total task performance	.35
	Reconnaissance Patrol	Total task performance	.35
TECHNICAL SPECIALIZATION	Auto Inspection	Effective expression	.49
	Road Damage and Radiation	Computing past radiation levels	.42
	Auto Inspection	Familiarity with equipment	.39
	Weapon Assessment	Total task performance	.37
MISSION PERSISTENCE	Reconnaissance Patrol	Security in PW interrogation	.57
	Reconnaissance Patrol	Reticence in PW interrogation	.52
	Reconnaissance Patrol	Avoiding pitfalls in PW interrogation	.44
	Auto Inspection	Completeness of vehicle ident info	.40
	Road Damage and Radiation	Continuing mission in face of enemy threat	.33
	Auto Inspection	Bearing and assurance	.33

Table 3 continued

Factor	Situation Task	Behavior Evaluated	r
EXECUTIVE DIRECTION ↓ versus	Security Mission	Endurance and stamina	.53
	Site Selection	Sum of perf rating judgments	.53
	Road Damage and Radiation	Endurance and stamina	.49
	Airfield Layout	Determining runway length	.38
	Commo Exhibit	Total task performance	.36
	Road Damage and Radiation	Handling tactical emergency by radio	.36
	Road Damage and Radiation	Attitude (cooperation)	.36
	Security Mission	Quick decisiveness	.36
TECHNICAL TENACITY	Hwy Traffic	Concentration under stress	.56
	Production Analysis	Completeness of written report	.31
TACTICAL SKILLS	March Order	Total task performance	.63
	March Order	Noting enemy positions	.59
	Airfield Layout	Total task performance	.54
	March Order	Motivation (effort)	.51
	March Order	Maintaining contact and security	.45
	Reconnaissance Patrol	Overall performance quality	.43
	March Order	Providing equipment and supplies	.41
	Road Damage and Radiation	Computing future radiation levels	.41
TECHNICAL SKILLS	Reconnaissance Patrol	Extent mission completed	.41
	Commo Exhibit	Handling circuit defects	.65
	Auto Inspection	Overall performance quality	.56
	Commo Exhibit	Use of reference manuals	.55
	Hwy Traffic	Overall performance quality	.54
	Supply Records	Flexibility in stress briefing	.54
	Auto Inspection	Utilization of personnel	.52
	Auto Inspection	Use of reference manuals	.51
	Commo Exhibit	Bearing and assurance	.49
	Commo Exhibit	Handling equipment defects	.46

Table 4

COMPONENTS USED TO ESTIMATE 17 DOB FACTOR SCORES

Factor	Instrument	Component Scales	r with Factor
MECHANICAL TECHNOLOGY	Individual Understanding Differential Inventory--A Personal Data Record Information Differential Inventory--A	Mechanical Orientation Manual Crafts Manual Skill and Interest Practical Skills Construction Interest	.866
COMBAT LEADERSHIP	Differential Inventory--B Differential Inventory--A Differential Inventory--B Individual Understanding Differential Inventory--A	Outdoor Skills and Combat Leadership Combat Interest Manual vs White Collar Interest Combat Ldr Orientation Nature Endurance	.857
ADMINI-STRATION	Information Personal Data Record Differential Inventory--B Individual Understanding	Finance Business Skill and Interest Administrative Interest Administration Orientation	.826
GENERAL KNOWLEDGE	Information Information Information Information Information Information	Entertainment Culture History and Politics Medical and Chemical Supply Literature and Arts Technology Content	.867
OUTDOOR ACTIVITY	Personal Data Record Differential Inventory--A Personal Data Record	Rural vs Urban Background Outdoor Interest Frontiersman Orientation	.732
PERSONAL ADJUSTMENT	Differential Inventory--B Differential Inventory--B Differential Inventory--A Individual Understanding Differential Inventory--B	Freedom from Neurosis Freedom from Anomie Emotional Control Healthy Self-acceptance Frustration Tolerance	.894
SPORTS	Differential Inventory--B Differential Inventory--A Physical Performance	Athletics Interest Sports Interest Kneeling Basketball Throw	.869
SOCIAL-ECONOMIC ADVANTAGE	Personal Data Record Differential Inventory--A	Economic-cultural Level Social Advantage	.810
LEADERSHIP READINESS	Speeded Practical Judgment Speeded Practical Judgment Speeded Practical Judgment	Ready Decision Making Readiness to Lead Resistance to Mediator Role	.757

Table 4 continued

Factor	Instrument	Component Scales	r with Factor
SUPERVISION	Differential Inventory--B Differential Inventory--B	Active Supervision Administrative Supervision	.822
SCIENCE	Differential Inventory--B Personal Data Record Individual Understanding Information	Scientific Interest Math-Science Skill and Interest Scientific Orientation Math and Physical Science	.877
AESTHETIC- INTELLECTUAL	Differential Inventory--A Individual Understanding Personal Data Record Differential Inventory--B Personal Data Record	Aesthetic Interest Aesthetic Intellectual Orientation Language Skill and Interest Military Intelligence Interest Social Science Skill and Interest	.868
AUTHORITY AND STRUCTURE	Individual Understanding Differential Inventory--B Differential Inventory--A Personal Data Record	Concern for Order Concern for Order Achievement Need Practical Concreteness	.551
EASYGOING- NESS	Differential Inventory--B Differential Inventory--A Individual Understanding	Easygoingness Easygoing Disposition Non-concern for Order	.602
STRICT COMMAND	Speeded Practical Judgment Speeded Practical Judgment Speeded Practical Judgment Speeded Practical Judgment	Combat Discipline "Taut Ship" Command Command Responsibility Non-lenient Relation to Men	.590
POLITICAL ORIENTATION	Information Personal Data Record	History and Politics Political Science Skill and Interest	.409
MANAGERIAL LEADERSHIP	Differential Inventory--B Differential Inventory--A Individual Understanding Differential Inventory--B Differential Inventory--B	Verbal-Social Leadership Interest Decisive Leader Interest Strict Discipline Orientation Administrative Leader Interest Aggressive Self-assurance	.810

Table 5

COMPONENTS USED TO ESTIMATE 30 OEC FACTOR SCORES

Factor	Situation Task	Component Variables	r with Factor
I	Security Mission	Overall combat aptitude Decisiveness without haste	.927
II	Communications Exhibit	Extent mission accomplished Use of reference manuals Motivation (effort)	.919
III	Roadblock	Overall combat aptitude Motivation (effort) Decisiveness without haste Orgn of mission briefing	.901
IV	Reconnaissance Patrol	Overall combat aptitude	.890
V	Production Analysis	Relevance of written report Overall admin effectiveness	.841
VI	Road Damage and Radiation Survey	Overall mission effectiveness	.860
VII	Road Damage and Radiation	Computing past radiation levels	.867
VIII	Automotive Inspection	Extent mission accomplished Use of reference manuals Motivation (effort) Defects appropriately treated	.880
IX	Roadblock Road Damage and Radiation March Order	Training and Supervision of subordinates Keeping cool Endurance and stamina (neg.)	.789
X	Observation Post	Overall combat aptitude Extent mission completed Effective mission behaviors Effective command	.801
XI	Site Selection	Motivation (effort) Bearing and assurance	.770
XII	Improper Supply Records	Bearing and poise in stress briefing Organization of stress briefing	.816
XIII	March Order	Extent mission completed	.810
XIV	Highway Traffic Plan	Extent mission accomplished Following instructions Motivation (effort)	.811
XV	Weapons Assessment	Reporting identification clues (2) Reporting mech and other intel.	.815

Table 5 continued

Factor	Situation Task	Component Variables	r with Factor
XVI	Reconnaissance Patrol	Maintain security in PW interrogation Self-control in PW interrogation Avoid pitfalls in PW interrogation	.827
XVII	Automotive Inspection	Effective command	.810
XVIII	Security Mission Road Damage and Radiation Hwy Traffic Plan	Endurance and stamina Orders to team out of gas Concentration under stress (neg.)	.707
XIX	Improper Supply Records	Tact and Control in stress briefing	.830
XX	Road Damage and Radiation	Consideration of men within mission requirements Continuing mission despite enemy threat Briefing team on mission (neg.)	.751
XXI	March Order	Noting enemy positions Providing equipment and supplies Maintaining contact and security	.719
XXII	Production Analysis	Conciseness of written report Brevity of sentence structure	.818
XXIII	Airfield Layout	Consideration of terrain in site evaluation Number of sites evaluated	.705
XXIV	Reconnaissance Patrol	Detail of mission briefing Organization of mission briefing Briefing on radio frequency for mission	.718
XXV	Roadblock	Consideration for men General ability Bearing and assurance Tactical control	.633
	Reconnaissance Patrol	Behaviors in enemy contact	
XXVI	Reconnaissance Patrol	Consideration for men Consideration within mission requirements	.558
XXVII	Reconnaissance Patrol	Detail in debriefing after PW interrogation Main aspects of debriefing Organization of debriefing Keeping cool	.652
XXVIII	Road Damage and Radiation	Recording radiation levels (2)	.550
XXIX	Site Selection	Following instructions Thoroughness in assigned task	.486
XXX	Office Management	Sequencing work flow	.520

Table 6

RELATION OF OEC TOTAL TASK SCORES TO 30 FACTORS

<u>Substitutability of Total Task Scores for Factor Scores</u>			
Factor	Task	Correlation with Total Task Score	r of Composite with Factor ^a
I	Security Mission	.927	.927
II	Communications Exhibit	.832	.919
III	Roadblock	.883	.901
IV	Reconnaissance Patrol	.890	.890
V	Production Analysis	.808	.841
VI	Road Damage and Radiation Survey	.860	.860
VIII	Automotive Inspection	.849	.880
X	Observation Post	.731	.801
XII	Improper Supply Records	.626	.816
XIII	March Order	.830	.810
XIV	Highway Traffic Plan	.780	.811
XV	Weapons Assessment	.734	.815
XXIII	Airfield Layout	.711	.705
XXIX	Site Selection	.611	.486
XXX	Office Management	.550	.520

^aObtained from Table 5

Table 7

COMPONENTS USED TO ESTIMATE SCORES ON
EIGHT CROSS-SITUATIONAL OEC FACTORS

Factor	Situation-Task	Component Variables	r with Factor
TECHNICAL-MANAGERIAL LEADERSHIP	Production Analysis Improper Supply Records Office Management	Total task performance Total task performance Total task performance	.997
COMBAT LEADERSHIP	Security Mission Observation Post Reconnaissance Patrol Roadblock	Total task performance Overall performance quality Forceful briefing after IPW interrogation General ability	.973
TEAM LEADERSHIP	Roadblock Site Selection Roadblock	Controlling on-site security Effective expression Motivation (effort)	.942
versus			
PERSONAL RESOURCE-FULNESS	March Order March Order Reconnaissance Patrol Production Analysis Road Damage and Radiation Reconnaissance Patrol	Endurance and stamina Effective military behavior Aggressiveness in enemy hands Completeness of written report Recording radiation levels Effectiveness in face of enemy	
COMMAND OF MEN	Reconnaissance Patrol Reconnaissance Patrol Security Mission Communications Exhibit Reconnaissance Patrol	Effective command Briefing men on purpose of mission Effective command Attitude (cooperation) Noting intelligence information under stress	.951
versus			
TECHNICAL SPECIALIZATION	Automotive Inspection Road Damage and Radiation Weapons Assessment Site Selection	Effective expression Computing past radiation levels Total task performance Thoroughness in assigned task	
MISSION PERSISTENCE	Reconnaissance Patrol Reconnaissance Patrol Reconnaissance Patrol Automotive Inspection Road Damage and Radiation Roadblock Weapons Assessment	Maintain security in IPW Uncongeniality in IPW Reticence in IPW Completeness of vehicle identification data Continuing mission despite enemy threat Consideration for men Attitude (cooperation)	.819
EXECUTIVE DIRECTION	Site Selection Road Damage and Radiation Airfield Layout Security Mission	Sum of rating judgments Endurance and stamina Determining runway length Quick decisiveness	.989
versus			
TECHNICAL TENACITY	Highway Traffic Plan Production Analysis Site Selection	Concentration under stress Sentence adequacy in written report Merit of sites chosen	
TACTICAL SKILLS	March Order March Order March Order Airfield Layout Airfield Layout March Order Reconnaissance Patrol Road Damage and Radiation Reconnaissance Patrol	Total task performance Overall performance quality Noting enemy positions Adequacy and number of sites evaluated Total task performance Maintaining contact and security Total task performance Computing future radiation levels Detail in mission briefing	.856
TECHNICAL SKILLS	Communications Exhibit Automotive Inspection Improper Supply Records Highway Traffic Plan Automotive Inspection	Handling circuit defects Overall performance quality Flexibility in stress briefing Overall performance quality Average importance of defects noted	.953

Table 8

PREDICTION OF LEADERSHIP BEHAVIOR FACTORS (OEC) BY
LEADER CHARACTERISTICS FACTORS (DOB)

	Technical-Managerial Leadership	Combat Leadership	Team Leadership vs Personal Resourcefulness	Command vs Technical Specialization	Mission Persistence	Executive Direction vs Technical Tenacity	Tactical Skills	Technical Skills
Mechanical Technology	07	15	00	-07	12	06	13	40
Combat Leadership	-05	36	-11	14	22	11	06	16
Administration	11	-10	05	06	-15	-02	-08	-17
General Knowledge	32	12	02	-03	13	12	26	37
Outdoor Activity	-18	14	-05	00	04	06	02	05
Personal Adjustment	04	00	02	08	02	-02	-01	-02
Sports	00	14	07	08	09	03	03	-22
Social-Economic Advantage	07	06	07	00	-09	02	06	-01
Leadership Readiness	15	17	-09	01	05	04	02	00
Supervision	02	11	-05	05	-03	03	-08	08
Science	37	12	02	-06	08	15	32	39
Aesthetic-Intellectual	-11	-14	01	05	01	02	-10	-13
Authority and Structure	-01	00	05	04	-02	00	01	-04
Easygoingness	03	05	-10	-04	04	-11	00	-02
Strict Command	-14	-08	03	08	-04	-04	-04	-03
Political Orientation	16	04	01	14	08	11	12	-01
Managerial Leadership	00	05	-02	12	04	02	-04	-20

Combat Leadership; Combat Leader and Political Orientation for Command vs Technical Specialization; Science for Executive Direction vs Technical Tenacity; and Combat Leader for Technical Skills. In the case of Technical Skills, substantial negative coefficients also appear, arising possibly from negative relationships between sports and management orientation on one side and mechanical-technical orientation on the other.

Table 9 gives the better predictors of the eight OEC factors from among the separate DOB variables. The strong cognitive predictors of Technical-Managerial Leadership are in evidence, mathematics and science leading the way, but with verbal-cultural and military tactics and sports information also present. The outdoor-combat-self-reliant pattern is clear in predicting Combat Leadership. Although coefficients are modest, the pattern of predictors of Factor III is also clear: practical, conscientious concreteness on the Team Leader end as against physical aggressiveness and individual combat competence on the Personal Resourcefulness end. Likewise on Factor IV, a combination of combat command skills and motivation relates to the Command of Men pole, while only Construction Interest is found at the Technical Specialist pole. Mission Persistence is predicted by the physical work and endurance qualities and the combat engineer skills. These skills, secondary predictors for Factor V, become primary for the Executive Direction pole of Factor VI, while the opposite pole seems to be predicted by a quiet tolerance and laissez-faire attitude, that of the man who goes ahead with his own job undisturbed by other persons or events. Factor VII, Tactical Skills, is fairly well predicted by scientific knowledge and orientation plus Military Tactics at a modest level. Factor VIII, Technical Skills, has a similar set of scientific predictors at a higher level, combined with technical and mechanical measures. Finally, Combat Leadership, Mission Persistence, and Technical Skills have administrative interest as a negative predictor.

PREDICTING SITUATION-SPECIFIC OEC BEHAVIOR FACTORS FROM DOB FACTORS

The next DOB-OEC relationships to be analyzed were those between DOB factors and the 30 situation-specific OEC behavioral factors. Table 10 gives the results for the 7 OEC factors concerned with behavior in combat command missions. The DOB Combat Leadership factor (II) was the best predictor of combat command factors in the OEC. Other DOB factors predicting more than one combat command factor significantly were Mechanical Technology (I), General Knowledge (IV), and Leadership Readiness (IX).

Table 11 presents results for factors of combat staff behaviors: two combat intelligence and one combat operations mission factor, and intelligence and operations aspects of combat tasks reflected in three other factors of staff behavior. For combat staff performance, Science (XI) and General Knowledge (IX) were the best predictors, with Combat Leadership secondary.

Table 9

PREDICTION OF LEADERSHIP BEHAVIOR FACTORS (OEC)
BY LEADER CHARACTERISTICS MEASURES (DOB)

<u>I. Technical-Managerial Leadership</u>		<u>V. Mission Persistence</u>	
Math and Physical Science Info	.44	Manual vs White-Collar Interest	.25
Math-Science Background	.38	Endurance Crawl	.19
Tech Operations Info	.34	Combat Interest	.18
Entertainment-Culture Info	.33	Nature Endurance	.18
Military Tactics Info	.30	Combat Engineer Interest	.17
Math-Science Content Info	.30	Practical Skills Info	.16
History-Politics Info	.28	Tech Operations Info	.16
Scientific Orientation	.28	Administrative Interest	-.20
Organized Sports Info	.27		
Two-Hand Coordination	.26	<u>VI. Executive Direction vs Tech Tenacity</u>	
Intellectual Games Info	.25	Tech Operations Info	.20
Scientific Interest	.25	Math and Physical Science Info	.19
		Combat Engineer Interest	.16
<u>II. Combat Leadership</u>		Medical-Chemical Info	.14
Outdoor Skill and Combat Leadership	.40	History-Literature Info	.14
Tech Operations Info	.31	Math-Science Background	.14
Manual vs White-Collar Interest	.31	Easygoing Disposition	-.14
Military Tactics Info	.29	Administrator Interest	-.13
Practical Skills Info	.28	Social Science Background	-.13
Sports Interest	.28		
Administrator Interest	-.26	<u>VII. Tactical Staff Skills</u>	
		Math and Physical Science Info	.37
<u>III. Team Leadership vs Personal Resourcefulness</u>		Tech Operations Info	.30
Capacity for Detail	.15	Math-Science Background	.28
Practical Concreteness	.14	Medical-Chemical Info	.27
Administrative Interest	.12	Scientific Interest	.25
Mediation	.12	Scientific Orientation	.25
Combat Interest	-.15	Math and Science Content Info	.24
Combat Ldr Orientation	-.13	Military Tactics Info	.23
Physical Leadership	-.12		
Aggressive Self-Assurance	-.12	<u>VIII. Technical Staff Skills</u>	
		Tech Operations Info	.57
<u>IV. Command of Men vs Tech Specialist</u>		Math and Physical Science Info	.45
Combat Ldr Orientation	.20	Technology Info	.42
Military Intelligence Interest	.17	Practical Skills Info	.41
Strict Discipline	.16	Medical-Chemical Info	.37
Military Tactics Info	.14	Mechanical Orientation	.36
Outdoor Skill and Combat Leadership	.14	Math-Science Background	.36
Political Science Background	.14	Diagram Interpretation	.34
Construction Work Interest	-.15	Manual Crafts Interest	.33
		Scientific Interest	.32
		Administrative Leadership Interest	-.31

Table 10

PREDICTION OF LEADERSHIP PERFORMANCE FACTORS
IN OEC COMBAT SITUATIONS

Predictor Factor (DOB)	Mission Effectiveness Factors				Other Combat Behaviors			Mean r
	Security Mission	Road- block	Recon Patrol	Obsn Post	Tac Control of Men ^a	Care of Men in Combat ^b	Security Under IPW ^b	
	I	III	IV	X	XXV	XXVI	XVI	
I Mechanical Technology	<u>14</u>	11	04	05	<u>15</u>	-01	03	07
II Combat Leadership	<u>23</u>	<u>17</u>	<u>13</u>	<u>24</u>	<u>26</u>	<u>11</u>	<u>17</u>	<u>19</u>
III Administration	-04	00	-02	-05	-10	01	-11	-04
IV General Knowledge	<u>13</u>	05	<u>13</u>	-02	<u>15</u>	04	07	08
V Outdoor Activity	<u>17</u>	07	02	11	07	-03	06	07
VI Personal Adjustment	04	08	03	-08	07	08	02	03
VII Sports	02	11	03	05	09	05	<u>12</u>	07
VIII Social-economic Advantage	06	08	00	01	00	01	-01	02
IX Leadership Readiness	<u>13</u>	-02	11	08	08	<u>14</u>	06	08
X Supervision (Logistics)	04	00	-02	03	10	-07	-03	01
XI Science	05	10	<u>15</u>	07	11	09	09	09
XII Aesthetic-Intellectual	-11	-02	-06	-12	-05	-03	-02	-06
XIII Authority and Structure	06	09	-01	-03	-01	04	-08	01
XIV Easygoingness	-01	-01	02	05	<u>12</u>	-08	03	02
XV Strict Command	-01	-10	-06	-02	06	05	-05	-02
XVI Political Orientation	08	05	04	-04	05	04	05	04
XVII Managerial Leadership	05	10	01	00	08	05	02	04

^aRoadblock Task^bReconnaissance Patrol Task

Table 11

PREDICTION OF COMBAT STAFF PERFORMANCE
FACTORS IN OEC SITUATIONS

Predictor Factor (DOB)	Mission Effectiveness Factors			Other Staff Behaviors				Mean r
	Rd Dmg & Radn (G-2) VI	March Order (G-3) XIII	Weapons Assess (G-2) XV	Opnl Arrange ^a (G-3) XXI	Mission Brief ^b (G-3) XXIV	Debrief After IPW ^b (G-2) XXVII		
I Mechanical Technology	<u>13</u>	<u>20</u>	00	03	01	04		07
II Combat Leadership	<u>17</u>	06	<u>14</u>	05	08	<u>16</u>		11
III Administration	-06	-07	-07	-08	-07	05		-05
IV General Knowledge	<u>24</u>	<u>26</u>	<u>13</u>	<u>15</u>	11	<u>17</u>		<u>18</u>
V Outdoor Activity	-02	00	05	04	08	04		03
VI Personal Adjustment	04	-01	01	-06	-01	02		00
VII Sports	-03	08	-03	02	05	-08		00
VIII Social-economic Advantage	04	03	08	06	05	03		05
IX Leadership Readiness	<u>14</u>	06	05	00	00	11		06
X Supervision (Logistics)	05	-10	05	-01	00	01		00
XI Science	<u>32</u>	<u>36</u>	<u>13</u>	<u>14</u>	11	07		<u>19</u>
XII Aesthetic-Intellectual	-02	- <u>13</u>	01	-05	-01	09		-02
XIII Authority and Structure	06	-02	-05	03	06	-04		01
XIV Easygoingness	-10	01	03	01	00	00		-01
XV Strict Command	-03	- <u>17</u>	-09	-09	-04	-10		-09
XVI Political Orientation	<u>13</u>	07	09	09	09	08		09
XVII Managerial Leadership	01	-09	02	-08	10	04		00

^aMarch Order Task^bReconnaissance Patrol Task

Table 12 shows findings on prediction of functional staff performance factors--personnel and logistics. General Knowledge and Science again head the list of predictors, but a minor factor, rather weakly defined, comes through strongly--Political Orientation (XVI) predicted personnel staff behaviors as well as did General Knowledge and Science, and proved a significant secondary predictor of logistics staff factors.

Table 13 shows prediction of technical specialist factors and special aspects of reporting technical data and plans. The Airfield Layout task factor and three of the technical reporting factors were not effectively predicted by DOB factors. However, the technical Signal and Ordnance missions were highly predicted: Mechanical Technology (I), Science (XI), General Knowledge (IV), and Combat Leadership (II), in that order on the positive side, and Aesthetic-Intellectual (XII), Administration (III), Sports (VII), and Managerial (XVII) factors on the negative side. Computation of radiation levels (OEC Factor VII) was predicted by Science, General Knowledge, and Mechanical Technology.

Table 14 gives results on prediction of other OEC command and staff behavioral factors. Only one was predicted significantly, at a modest level. DOB factors of Sports (VII), Political Orientation (XVI), General Knowledge (IV), and Aesthetic-Intellectual (XII) predicted command and use of men in the Automotive Inspection task. This finding contrasts with the negative prediction by Sports, Aesthetic, and Political Orientation of the Technical specialist mission itself in the Automotive Inspection task. It would appear that the supervisory-command aspects are somewhat antithetical to the technical specialist aspects. This finding recalls the bipolarity of OEC Factor IV of the cross-situational set, in which Command of Men and Technical Specialist were defined as opposite poles. It is possible that the Sports-Aesthetic-Political factors reflect an orientation to a rather free communication and interchange with other persons in contradistinction to a strong task orientation focusing on material objects which characterized the technical specialist.

PREDICTING THE THIRTY OEC BEHAVIOR FACTORS FROM DOB SCALES

Tables 15 to 21 present results on prediction of the 30 OEC leadership behavior factors from individual DOB scales. As in the preceding section, the 30 factors have been grouped into categories of leadership performance in combat situations, combat staff, personnel staff, logistics staff, technical specialist, technical reporting, and other command and staff interactions.

Leadership performance in OEC combat situations was predicted primarily by combat and practical military knowledge of tactics and technology, and by a similar set of motivational variables (Table 15). Regarding individual

Table 12

PREDICTION OF FUNCTIONAL STAFF PERFORMANCE
FACTORS IN OEC SITUATIONS

Predictor Factor (DOB)	Personnel Mission Effectiveness			Logistics Mission Effectiveness		
	Production Analysis	Office Mgt	Mean r	Site Sel	Supply Records	Highway Traffic
	V	XXX	r	XI	XII	XIV
I Mechanical Technology	03	-04	00	10	11	13
II Combat Leadership	05	-01	02	11	04	06
III Administration	<u>13</u>	07	10	07	06	-01
IV General Knowledge	<u>29</u>	<u>17</u>	<u>23</u>	<u>12</u>	<u>21</u>	<u>26</u>
V Outdoor Activity	-06	-09	-08	01	00	-01
VI Personal Adjustment	06	07	06	05	02	05
VII Sports	07	-09	-01	05	-03	-16
VIII Social-economic Advantage	11	01	06	11	<u>14</u>	06
IX Leadership Readiness	<u>14</u>	10	<u>12</u>	03	08	10
X Supervision (Logistics)	11	04	08	08	02	-01
XI Science	<u>26</u>	<u>13</u>	<u>20</u>	<u>15</u>	<u>17</u>	<u>20</u>
XII Aesthetic-Intellectual	-06	-05	-06	02	-08	-09
XIII Authority and Structure	-02	-04	-03	01	04	-01
XIV Easygoingness	-06	00	-03	00	-02	01
XV Strict Command	-01	05	02	-10	-12	-10
XVI Political Orientation	<u>27</u>	<u>15</u>	<u>21</u>	<u>12</u>	<u>13</u>	<u>10</u>
XVII Managerial Leadership	07	02	04	04	07	-07

Table 13

PREDICTION OF TECHNICAL SPECIALIST AND STAFF BEHAVIOR FACTORS IN OEC SITUATIONS

Predictor Factor (DOB)	Mission Effectiveness Factors				Other Staff Behaviors			
	Commo	Auto	Airfield	Concise Report (Prod Anal)	Thorough Report (Site Sel)	Quantitative Report (Rd Dmg & Radn)	XXII	XXVIII
	Exhib (Sig) II	Inspect (Ord) VIII	Layout (Engr) XXIII		XXIX			
I Mechanical Technology	<u>35</u>	<u>37</u>	04	03	08	<u>13</u>	02	02
II Combat Leadership	<u>16</u>	<u>12</u>	-03	-02	02	00	04	04
III Administration	-16	-16	-03	01	02	04	04	04
IV General Knowledge	<u>29</u>	<u>25</u>	09	-03	08	<u>17</u>	07	07
V Outdoor Activity	11	<u>23</u>	00	06	05	-02	05	05
VI Personal Adjustment	03	-01	-03	-02	-05	02	07	07
VII Sports	-18	-12	-04	-03	-03	-09	08	08
VIII Social-economic Advantage	07	-01	-04	03	<u>12</u>	00	-02	-02
IX Leadership Readiness	-03	04	-07	00	01	-01	05	05
X Supervision (Logistics)	-11	-04	-09	06	01	-08	-01	-01
XI Science	<u>38</u>	<u>23</u>	09	-03	09	<u>26</u>	07	07
XII Aesthetic-Intellectual	-20	-17	00	-02	-03	-11	-03	-03
XIII Authority and Structure	01	05	01	00	04	02	02	02
XIV Easygoingness	-07	-03	-04	02	-05	-03	-06	-06
XV Strict Command	01	04	-02	03	-10	-10	-09	-09
XVI Political Orientation	00	-07	02	-01	01	-03	-01	-01
XVII Managerial Leadership	-13	-12	-08	-04	02	-01	02	02

Table 14

PREDICTION OF OTHER COMMAND AND STAFF INTERACTION FACTORS IN OEC SITUATIONS

Predictor Factor (DOB)	Effective Command and Consideration for Men				Combat Endurance vs Technical Persistence XVIII		Tact-Flexibility Supply Records XIX	
	Auto Insp XVII	Rd Dmg & Radn XX	Direct Men vs Self-Reliance IX					
I Mechanical Technology	-01	10	09		-05		02	
II Combat Leadership	11	-03	-02		00		02	
III Administration	07	-09	02		04		03	
IV General Knowledge	<u>12</u>	04	-04		-03		09	
V Outdoor Activity	-02	00	00		07		08	
VI Personal Adjustment	07	-06	06		-08		01	
VII Sports	<u>15</u>	-09	06		05		06	
VIII Social-economic Advantage	07	-07	05		03		-05	
IX Leadership Readiness	11	00	-03		03		09	
X Supervision (Logistics)	-05	-08	-01		03		-10	
XI Science	05	02	06		-09		10	
XII Aesthetic-Intellectual	<u>12</u>	02	-04		07		-02	
XIII Authority and Structure	-02	04	08		01		04	
XIV Easygoingness	01	00	-01		00		-15	
XV Strict Command	-01	-07	01		02		-07	
XVI Political Orientation	<u>13</u>	-02	-03		10		-05	
XVII Managerial Leadership	10	-05	-03		07		-04	

Table 15

DOB SCALES MOST PREDICTIVE OF LEADERSHIP PERFORMANCE FACTORS IN OEC COMBAT SITUATIONS

Predictor Scale (DOB)	Mission Effectiveness Factors				Other Combat Behaviors				Mean r
	Mission Security I	Road- block III	Recon Patrol IV	Obsn Post X	Tac Control of Men ^a XXV	Care of Men in Combat ^b XXVI	Security Under IPW ^b XVI		
Outdoor Skills & Combat Leadership	22	17	17	26	26	16	11	19	
Manual vs White-Collar Interests	24	14	07	24	23	06	22	17	
Military Tactics Information	22	12	22	20	21	03	09	16	
Technology Operations Information	20	12	18	18	21	-01	11	14	
Nature Endurance	17	17	05	18	13	06	15	13	
Combat Engineering Interest	19	06	08	16	26	06	09	13	
Mathematics & Physical Science Information	09	13	18	11	17	09	11	13	
Combat Interest	12	04	10	17	20	08	16	12	
Non-Aesthetic Interest	15	14	13	19	14	02	02	11	
Practical Skills Information	18	12	08	14	15	-02	13	11	
Endurance Crawl	18	08	12	10	08	10	12	11	
Medical and Chemical Information	18	06	17	00	20	08	04	10	
Administrator Interest	-18	-09	-12	-25	-25	-04	-09	-15	
Mean r ^c	18	11	13	17	19	06	11		

^aRoadblock Task^bRecon Patrol Task^cAbsolute Values

Table 16

DOB SCALES MOST PREDICTIVE OF COMBAT STAFF PERFORMANCE FACTORS IN OEC SITUATIONS

Predictor Scale (DOB)	Mission Effectiveness Factors			Other Staff Behaviors				Mean r
	Rd Dmg & Radn (G-2) VI	March Order (G-3) XIII	Weapons Assess (G-2) XV	Opnl Arrange ^d (G-3) XXI	Mission Brief ^e (G-3) XXIV	Debrief After IPW ^e (G-2) XXVII		
Math-Phys Science Info	39	40	17	17	13	11	23	
Tech Operations Info	37	36	16	11	16	17	22	
Medical-Chemical Info	23	31	19	19	09	13	17	
Practical Skills Info	20	25	16	14	05	18	16	
Scientific Interest	27	30	10	17	10	03	16	
Math-Sci Skill-Int	26	34	12	11	07	06	16	
Military Tactics Info	21	20	06	16	14	18	16	
Math-Sci Content Info	16	35	02	13	12	09	14	
Hist-Polit-Cult Info	19	18	13	12	09	13	14	
Tech Content Info	23	17	10	10	12	12	14	
Intellectual Games Info	16	15	08	13	08	15	12	
Scientific Orientation	23	26	10	06	11	-01 ^f	12	
History-Lit Content Info	10	14	12	09	15	09	12	
Supply Information	14	18	05	09	15	08	12	
Entertainment Cult Info	16	15	12	07	-02 ^f	18	11	
Econ & Sociology Info	14	16	06	06	09	13	11	
Combat Interest	14	04	12	14	10	10	11	
Two-Hand Coordination	17	06	08	16	02	12	10	
Practical Concreteness	16	14	-02 ^f	11	14	07	10	
Administrator Interest	-18	-13	-08	-03	-14	-17	-12	
Social Science Skill-Int	-19	-17	-11	00	-11	-11	-12	
Mean ^f	20	21	10	11	10	11		

^dMarch Order Task^eRecon Patrol Task^fAbsolute values, but negatives with positive average are subtracted.

Table 17

DOB SCALES MOST PREDICTIVE OF PERSONNEL STAFF
PERFORMANCE FACTORS IN OEC SITUATIONS

Predictor Scale (DOB)	<u>Mission Effectiveness Factors</u>		Mean r
	<u>Production</u>	<u>Office</u>	
	<u>Analysis</u> V	<u>Management</u> XXX	
Hist-Polit-Culture Info	31	23	27
Math-Phys Science Info	36	17	26
Entertainment Cult Info	27	19	23
Military Tactics Info	28	17	22
Tech Operations Info	29	12	20
Math-Science Content Info	24	16	20
Medical-Chemical Info	25	12	18
Econ-Sociology Info	24	13	18
Math-Science Skill-Int	25	11	18
Organized Sports Info	17	18	18
Political Science Info	14	19	16
Scientific Interest	20	13	16
Supply Information	21	08	14
Ready Decision-Making	12	16	14
Finance Information	14	12	13
Intellectual Games Info	15	10	12
Military Intelligence Int	12	12	12
Two-Hand Coordination	14	10	12
Readiness to Lead	13	09	11
Non-Quantitative Miscel Info	13	08	10
Scientific Orientation	13	08	10
Mean r	20	13	

Table 18

DOB SCALES MOST PREDICTIVE OF LOGISTICS STAFF
PERFORMANCE FACTORS IN OEC SITUATIONS

Predictor Scale (DOB)	Mission Effectiveness Factors			Mean r
	Site Selection XI	Supply Records XII	Highway Traffic XIV	
Tech Operations Info	22	28	38	29
Math-Phys Science Info	17	18	30	22
Intellectual Games Info	16	15	24	18
Medical-Chemical Info	08	20	27	18
Scientific Interest	13	15	26	18
Math-Science Skill-Int	13	16	25	18
Entertainment Cult Info	18	15	20	18
Practical Skills Info	19	09	23	17
Econ-Sociology Info	13	18	18	16
Diagram Interpretation	09	14	25	16
Scientific Orientation	13	11	23	16
Hist-Polit-Culture Info	08	22	16	15
Two-Hand Coordination	06	18	16	13
Military Tactics Info	09	11	19	13
Math-Science Content Info	08	13	17	13
Social Advantage Bkgrd	16	14	07	12
Tech Content Info	03	14	18	12
Supply Information	03	14	17	11
Finance Content Info	04	14	16	11
Nature Endurance	14	09	09	11
Practical Concreteness	04	17	11	11
Non-Quantitative Miscel Info	05	13	13	10
Non-Aesthetic Int	06	11	13	10
Administrator Int	-09	-08	-16	-11
Taut Ship Command	-03	-16	-12	-10
Mean r	10	15	19	

Table 19

DOB SCALES MOST PREDICTIVE OF TECHNICAL SPECIALIST
FACTORS IN OEC SITUATIONS

Predictor Scale (DOB)	Commo Exhibit II	Auto Inspect VIII	Airfield Layout XXIII	Mean r
Tech Operations Info	48	41	10	33
Math-Phys Science Info	44	27	12	28
Mechanical Orient	38	37	01	25
Practical Skills Info	36	34	05	25
Medical-Chemical Info	33	28	10	24
Tech Content Info	31	36	02	23
Scientific Interest	33	20	12	22
Math-Science Skill-Int	36	20	04	20
Manual Crafts Int	23	33	01	19
Diagram Interpretation	27	24	06	19
Scientific Orient	26	18	06	17
Military Tactics Info	30	15	00	15
Combat Engineer Int	15	24	06	15
Supply Information	10	22	07	13
Manual Skill-Interest	15	15	06	12
Manual vs. White-Collar Int	20	19	-04	12
Math-Science Content Info	20	06	08	11
Outdoor Information	14	17	01	11
Outdoor Interest	12	18	02	11
Intellectual Games Info	21	12	-02	10
Construction Interest	15	13	03	10
Econ-Sociology Info	22	09	-01	10
Nature Endurance	20	11	-01	10
Administrator Int	-27	-24	-04	-18
Administrative Leader	-23	-22	-02	-16
Sociability	-23	-13	-10	-15
Social Science Skill-Int	-26	-20	10	-12
Administrative Supv	-17	-05	-13	-12
Political Science Skill-Int	-16	-14	-04	-11
Sports Interest	-16	-13	-02	-10
Military Intel Int	-10	-17	-04	-10
Administrator Int	-13	-13	-04	-10
Mean r	24	20	04	

Table 20

DOB SCALES MOST PREDICTIVE OF TECHNICAL REPORTING
FACTORS IN OEC SITUATIONS

Road Damage and Radiation Survey			
<u>Computing Radiation Levels</u>		<u>Recording Radiation Levels</u>	
<u>Predictor Scale (DOB)</u>	<u>VII</u>	<u>Predictor Scale (DOB)</u>	<u>XXVIII</u>
Math-Phys Science Info	26	Frontiersman	18
Math-Science Skill-Int	25	Sports Interest	13
Scientific Interest	23	Tech Operations Inf	12
Scientific Orient	22	Math-Phys Science Inf	12
Tech Operations Info	19	Manual Crafts Int	12
Medical-Chemical Info	17	Physical Leadership	12
Math-Science Content Info	15		
Diagram Interpretation	15	<u>Site Selection</u>	
Manual Skill-Interest	15	<u>Thorough Reporting</u>	
Military Tactics Info	14	<u>Predictor Scale (DOB)</u>	<u>XXIX</u>
Finance Content Info	13	Sociability	15
Intellectual Games Info	12	Medical-Chemical Info	14
Tech Content Info	12	Hist-Literature Info	14
Supply Information	12	Two-Hand Coordination	14
Econ-Sociology Info	12	Math-Phys Science Info	13
Administrator Int	-17	<u>Tech Operations Info</u>	<u>12</u>
Sociability	-16	Taut Ship Command	-13
Social Science Skill-Int	-15	Command Responsibility	-13
Administrative Supv	-14		
Political Science Skill-Int	-14	<u>Production Analysis</u>	
		<u>Concise Reporting</u>	
			<u>XXII</u>
		No statistically significant prediction from DOB scales	

Table 21

DOB SCALES MOST PREDICTIVE OF OTHER COMMAND
AND STAFF INTERACTION FACTORS IN OEC SITUATIONS

Effective Command and Consideration for Men			
<u>Automotive Inspection</u>		<u>Direction of Men vs Self Reliance</u>	
<u>Predictor Scale (DOB)</u>	<u>XVII</u>	<u>Predictor Scale (DOB)</u>	<u>IX</u>
Human Science Info	21	Econ-Sociology Info	17
Political Science Info	20	Mechanical Orient	14
Manual vs White-Collar Int	19	Scientific Interest	13
Aggress Self-Assur	18	Practical Concreteness	12
Mil Intelligence Int	18	-----	
Hist-Polit-Cult Info	17	Hist-Literature Info	-13
Military Tactics Info	17	Easygoingness (B)	-12
Aesthetic-Intellect Orient	17	-----	
Sports Interest	16	<u>Combat Endurance vs Tech Persistence</u>	
Quiet Life Orient	14	<u>Predictor Scale (DOB)</u>	<u>XVIII</u>
Endurance Crawl	14	Sociability	16
Kneel Basketball Throw	13	Language Skill-Int	14
Finance Information	12	Political Science Skill-Int	14
-----		Practical Concreteness	13
Administrator Int	-13	Kneel Basketball Throw	13
-----		-----	
<u>Road Damage & Radn Survey</u>		Capacity for Detail	-15
<u>Predictor Scale (DOB)</u>	<u>XX</u>	Diagram Interpretation	-14
Construction Interest	16	Social Responsibilities	-14
Concern for Order	14	Considerate Leniency	-12
-----		Math-Science Skill-Int	-12
Organized Sports Info	-19	-----	
Verbal-Social Leader	-15	<u>Tact and Flexibility (Supply Records)</u>	
Active Supervision	-14	<u>Predictor Scale (DOB)</u>	<u>XIX</u>
Administrator Orient	-14	Hist-Literature Info	20
Sociability	-13	Kneel Basketball Throw	20
Management Drive	-12	Tech Operations Info	17
-----		Medical-Chemical Info	17
		Diagram Interpretation	15

OEC factor prediction, it is notable that Tactical Control of Men in the Roadblock task was the best predicted--considerably better than the Roadblock Mission Effectiveness Factor, which had a larger technical content. The mission effectiveness factors in Security Mission and Observation Post are also among the better-predicted factors of this set. But perhaps the most striking finding is that the motivational variables predicted these combat leadership behaviors slightly better than did the cognitive measures.

Combat staff performance in the OEC was strongly predicted by cognitive measures, with mathematics, science, and military technology leading the way (Table 16). Scientific interest and orientation were the best non-cognitive predictors. Best-predicted were the two mission effectiveness factors--Road Damage and Radiation, and March Order--which demanded the exercise of combat staff skills under conditions of sustained stress in a combat emergency. Weapons Assessment was a much shorter task than Road Damage and Radiation. The briefing and debriefing aspects of the Reconnaissance Patrol task were likewise performed under less immediate stress or sustained pressure. Operational Arrangements included in the March Order required good completed staff work of a mixed operations-logistic nature. In general, however, the major finding here is the predominance of cognitive predictors for combat staff performance in contrast to the stronger role of motivational predictors in the combat command factors.

Again, cognitive variables led in prediction of personnel staff and logistics staff performance (Tables 17, 18). The major difference between the order of predictors for the two types of staff functioning is that general-knowledge/verbal-information measures characterize the higher predictors of personnel staff work, while technical-scientific information measures lead the list of logistics predictors. The best predicted factors were Production Analysis and Highway Traffic--two tasks that called primarily for integrative problem-solving; Site Selection and Supply Records had the added aspect of persuading resistant officers at lower echelons to accept the solutions. The Office Management Factor appears to be less reliable (see Table 6) and prediction would therefore be expected to be lower.

Likewise, Technical Specialist factors in the OEC were best predicted by scientific and technical information measures generally. One difference from the prediction of staff performance is found, however, in the validity of DOB scales of mechanical orientation and information (Table 19). Among the factors, Communications Exhibit and Automotive Inspection were relatively well predicted, but Airfield Layout was not. The limited nature of the task--primarily following manuals and making computations--may well explain this.

Tables 20 and 21 present data on DOB validity for OEC factors concerned with technical reporting, command of and consideration of men, and the two bipolar factors. Computing radiation levels was primarily predicted by the scientific information and motivation scales of the DOB. Recording radiation levels, however, seems to be reflecting the

time pressure and prolonged stress of the Road Damage and Radiation task. The command factor from the Automotive Inspection task again indicates the contrast noted earlier in prediction from DOB factors: Its best predictors indicate an active, aggressive style rather than one of technical specialization. Prediction of other factors was meagre.

The negative validity patterns of certain DOB scales are worth noting. Administrative variables of the DOB showed negative validity for all categories and for individual tasks as well.

PREDICTING TOTAL SCORES ON OEC SITUATION-TASKS

As a final step, prediction of total performance scores on OEC situation tasks from DOB scales and factors was analyzed. DOB scale results are shown for combat command tasks (Table 22), combat staff tasks (Table 23), personnel and logistics staff tasks (Table 24), and technical specialist tasks (Table 25). Findings paralleled rather closely those from the mission effectiveness factors for the given tasks. For combat command (Tables 15 and 22) and combat staff tasks (Tables 16 and 23), four of the top five DOB scales in validity are the same; for combat staff, the fifth most valid scale for the mission effectiveness factors was sixth in validity order for the total scores, and vice versa. For logistics staff and technical specialist, four out of five top scales are the same; for personnel staff, three out of five. Of the top 10, 9 are identical for combat command, combat staff, and technical specialist; 7 are identical for personnel and logistics staff. Validity of given scales is consistently higher for the total task scores than for the mission effectiveness factors, however, the average difference being between .02 and .03.

DOB factor prediction of total scores on OEC tasks is presented in Table 26. The Science factor (XI) of the DOB was the best across-the-board predictor. Combat Command tasks were best predicted by the DOB Combat Leadership factor, with Science, Mechanical Technology, and General Knowledge secondary. For Combat Staff tasks, Science was highest, with General Knowledge, Mechanical Technology, and Combat Leadership following. Science was again highest for Personnel Staff, with General Knowledge next, and Leadership Readiness just attaining significance. General Knowledge and Science were virtually equal co-predictors of Logistics Staff performance. Technical Specialist tasks were well predicted by Mechanical Technology and Science, followed by General Knowledge and Combat Leadership. Among negative predictors, Aesthetic-Intellectual was most consistent across-the-board.

Table 22

DOB SCALES MOST PREDICTIVE OF COMBAT LEADERSHIP
TASKS IN OEC SITUATIONS

Predictor Scale (DOB)	Secur Mission	Road block	Recon Patrol	Obsn Post	Mean r
Outdoor Skill & Combat Lead	26	16	22	28	23
Military Tactics Info	27	14	27	21	22
Tech Operations Info	27	18	19	21	21
Manual vs White Collar Int	24	19	11	31	21
Math-Phys Science Info	19	23	19	15	19
Non-Aesthetic Interest	14	13	17	27	18
Combat Engineer Int	18	12	15	26	18
Practical Skills Info	26	12	18	14	18
Nature Endurance	17	18	06	19	15
Econ-Sociology Info	18	12	16	13	15
Medical-Chemical Info	24	07	19	05	14
Practical Concreteness	10	20	13	12	14
Combat Interest	11	03	19	17	12
Scientific Interest	06	20	10	14	12
Ready Decision-Making	16	07	17	10	12
Math-Science Content Info	08	16	13	11	12
Mechanical Orient	07	16	10	15	12
Endurance Crawl	16	02	17	13	12
Hist-Polit-Cult Info	18	04	16	08	12
Tech Content Info	20	02	15	09	12
Physical Leadership	14	09	15	08	12
Combat Leader Orient	09	12	11	12	11
Political Science Info	07	14	11	11	11
Outdoor Interest	08	09	12	13	10
Math-Science Skill-Int	09	06	14	11	10
Administrator Int	-20	-07	-21	-22	-18
Social Science Skill-Int	-21	01	-20	-13	-13
Administrative Int	-10	-09	-13	-14	-12
Capacity for Detail	-17	-01	-15	-09	-10

Table 23

DOB SCALES MOST PREDICTIVE OF COMBAT STAFF
TASKS IN OEC SITUATIONS

Predictor Scale (DOB)	Weapons Assess	Road Dmg & Radn	March Order	Mean r
Tech Operations Info	39	37	37	38
Math-Phys Science Info	27	39	46	37
Medical-Chemical Info	28	23	32	28
Practical Skills Info	38	20	22	27
Math-Science Skill-Int	21	26	33	27
Scientific Interest	20	27	28	25
Scientific Orient	19	23	29	24
Military Tactics-Info	20	21	24	22
Tech Content Info	25	23	14	21
Hist-Polit-Cult Info	19	19	17	18
Diagram Interpretation	24	13	17	18
Entertainment Cult Info	14	16	20	17
Combat Engineer Int	28	13	08	16
Manual vs White-Collar Int	26	08	14	16
Math-Science Content Info	06	16	25	16
Two-Hand Coordination	15	17	15	16
Combat Interest	21	14	11	15
Intellectual Games Info	13	16	16	15
Organized Sports Info	00	11	28	13
Manual Skill-Interest	12	12	14	13
Nature Endurance	17	14	07	13
Practical Concreteness	05	16	16	12
Outdoor Skill & Combat Ldr	25	10	01	12
Supply Information	11	14	09	11
Non-Aesthetic Int	16	05	12	11
Political Science Info	11	16	04	10

Administrator Int	-20	-18	-15	-18
Administrative Int	-21	-10	-17	-16
Social Science Skill-Int	-11	-19	-15	-15
Sociability	-14	-10	-18	-14
Administrative Leadership	-14	-08	-16	-13
Business Skill-Interest	-11	-10	-12	-11
Administrative Supervision	-01	-10	-19	-10

Table 24

DOB SCALES MOST PREDICTIVE OF FUNCTIONAL STAFF
TASKS IN OEC SITUATIONS

Predictor Scale (DOB)	Personnel Staff Tasks		Logistics Staff Tasks			Mean r
	Off Mgt	Prod Analy	Sup Rec	Site Sel	Hwy Traf	
Tech Operations Info	15	27	34	24	28	26
Math-Sci Skill-Int	29	27	28	24	18	25
Math-Phys Sci Info	24	34	40	23	19	24
Scientific Interest	23	24	31	13	16	21
Entertain Cult Info	19	29	25	15	18	21
Medical-Chemical Info	12	17	32	21	22	21
Math-Sci Content Info	18	24	25	16	17	20
Hist-Polit-Cult Info	08	26	29	14	15	18
Scientific Orient	12	19	31	16	10	18
Military Tactics Info	19	28	20	11	04	16
Two-Hand Coordination	18	22	17	15	09	16
Political Science Info	14	22	13	17	12	16
Intellectual Games Info	07	21	28	10	13	16
Finance Content Info	04	20	22	16	15	15
Econ-Sociology Info	12	21	20	08	16	15
Practical Skills Info	09	10	19	17	21	15
Supply Information	09	17	19	13	17	15
Organized Sports Info	18	26	17	09	02	14
Tech Content Info	08	14	17	16	14	14
Non-Quant Miscel Info	16	15	18	13	02	13
Capacity for Detail	13	15	18	13	02	12
Diagram Interpretation	03	04	18	21	11	11
Finance Information	10	13	19	07	07	11
Human Science Info	08	21	10	07	09	11
Non-Aesthetic Int	14	08	08	14	08	10
Taut Ship Command	-10	-18	-19	-11	-07	-13

Table 25

DOB SCALES MOST PREDICTIVE OF TECHNICAL SPECIALIST
TASKS IN OEC SITUATIONS

Predictor Scale (DOB)	Commo Exhibit	Auto Inspect	Airfield Layout	Mean r
Tech Operations Info	57	39	18	38
Math-Phys Science Info	51	25	26	34
Practical Skills Info	42	35	11	29
Mechanical Orient	43	38	07	29
Tech Content Info	42	32	09	28
Medical-Chemical Info	33	25	16	25
Scientific Orient	31	22	17	23
Manual Crafts Int	32	33	04	23
Scientific Interest	35	21	13	23
Math-Science Skill-Int	35	17	16	23
Combat Engineer Int	23	21	14	19
Math-Science Content Info	30	09	18	19
Military Tactics Info	32	11	13	19
Diagram Interpretation	31	15	06	17
Supply Information	15	24	10	16
Human Science Info	20	10	17	16
Econ-Sociology Info	24	11	12	16
Nature Endurance	22	20	05	16
Construction Interest	13	20	13	15
Manual vs White-Collar Int	29	21	-05	15
Manual Skill-Interest	14	22	06	14
Hist-Polit-Cult Info	18	02	18	13
Outdoor Interest	09	34	-05	13
Entertainment Cult Info	23	-01	14	12
Combat Interest	21	11	03	12
Outdoor Skill & Combat Lead	17	18	-03	11
Intellectual Games Info	22	05	03	10
Administrator Int	-29	-17	-11	-19
Social Science Skill-Int	-24	-22	-05	-17
Sociability	-25	-10	-12	-16
Administrative Leader	-26	-11	-06	-14
Administrator Int	-21	-11	-10	-14
Political Science Skill-Int	-16	-20	-04	-13
Sports Interest	-14	-17	-07	-13
Athletic Interest	-15	-13	-04	-11

Table 26

PREDICTION OF OEC TOTAL SCORES ON SITUATION-TASKS

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII
	Mechanical	Combat	Administration	General	Outdoor	Personal	Sports	Social Economic	Leadership	Supervision	Science	Aesthetic	Authority and	Proficiency	Strict Command	Political	Managerial
Office Management ^c	.00	-.06	.02	.15	-.10	-.02	.00	-.05	.08	-.02	.24	-.12	-.01	.04	-.08	.02	.00
Production Analysis ^c	.04	.02	.12	.25	-.12	.07	.04	.04	.15	.05	.29	-.10	-.04	.00	-.14	.18	.02
Improper Supply Records ^d	.11	-.07	.10	.32	-.12	.03	-.05	.15	.11	.02	.36	-.09	-.02	.03	-.11	.17	.00
Site Selection ^d	.16	.11	.05	.22	.00	.01	.01	.14	.02	.01	.21	-.08	.02	-.05	-.12	.09	.11
Highway Traffic Plan ^d	.09	.00	.00	.23	.00	-.02	-.18	.04	.03	-.02	.17	-.05	-.05	.00	-.07	.09	-.04
Communications Exhibit ^e	.42	.25	-.18	.34	.09	-.04	-.15	.07	.03	-.06	.44	-.26	.03	.04	.05	.01	-.08
Automotive Inspection ^e	.42	.19	-.08	.21	.20	-.02	-.16	.06	-.05	-.04	.23	-.20	-.03	-.06	-.01	-.11	-.03
Weapons Assessment ^b	.24	.24	-.18	.22	.09	.04	-.09	.10	.15	.05	.24	-.08	-.02	-.01	-.08	.07	-.01
Airfield Layout ^e	.11	.00	.01	.15	-.01	.02	-.05	.04	.06	-.04	.20	.02	-.02	.00	-.04	.09	-.01
Road Dmg & Radn Survey ^b	.13	.17	-.06	.24	-.02	.04	-.03	.03	.14	-.06	.32	-.02	.05	-.10	-.03	.13	.01
Security Mission ^a	.11	.22	-.07	.19	.09	-.01	-.07	-.04	.16	.04	.11	-.14	.03	.04	-.07	.12	.04
Roadblock ^a	.13	.17	-.03	.04	.05	.02	.03	.05	.04	-.03	.18	-.01	.06	-.08	-.03	.04	.01
Reconnaissance Patrol ^a	.08	.18	-.04	.19	.13	.06	.06	.07	.15	-.04	.14	-.07	.07	.00	-.03	.09	.06
Observation Post ^a	.14	.27	-.10	.04	.14	-.02	.11	-.02	.04	-.01	.14	-.17	.04	.02	.05	.04	.00
March Order ^b	.15	.07	-.17	.22	.07	-.05	.07	.04	.00	-.14	.38	-.21	-.02	.02	.00	.08	-.06
Combat Command Tasks (4)	.12	.21	-.06	.12	.10	.02	.03	.02	.10	-.01	.14	-.10	.05	.00	-.02	.07	.03
Combat Staff Tasks (3)	.17	.16	-.14	.23	.05	.01	-.02	.06	.10	-.05	.31	-.10	.00	-.03	-.04	.09	-.02
Personnel Staff Tasks (2)	.02	-.02	.07	.20	-.11	.02	.02	.00	.12	.02	.26	-.11	-.02	.02	-.11	.10	.01
Logistics Staff Tasks (3)	.09	.01	.05	.26	-.04	.01	-.07	.11	.05	.00	.25	-.07	-.02	-.01	-.10	.12	.02
Technical Specialist Tasks (3)	.32	.15	-.12	.23	.09	-.01	-.12	.06	.01	-.05	.29	-.15	-.01	-.01	.00	.00	-.04

^a Combat Command Tasks (4)^b Combat Staff Tasks (3)^c Personnel Staff Tasks (2)^d Logistics Staff Tasks (3)^e Technical Specialist Tasks (3)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The present Research Report is one of a series of major publications marking the culmination of the OFFICER PREDICTION research program and the impact of the findings on ARI's ongoing and newly-formulated program on officer evaluation and career development. The first publication in the series (Technical Research Report 1172) presents important dimensions of officer leadership behavior derived from analyses of more than 2000 single observations and judgments by trained military staff on each officer participant during a three-day Officer Evaluation Center (OEC) simulation. A second publication in this series (TRR 1173) presents		

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| 19. *Officer leadership | Computer-assisted simulation |
| *Leadership behavior | Experimental predictors |
| Leadership domains | Leadership selection research |
| *Leadership behavior domains | Psychological scales |
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| Simulated combat | Manpower systems |

20. the major psychological factors derived from officer responses to tests of the experimental Differential Officer Battery (DOB) and describes the refinement of the measured obtained to a manageable number of experimental predictor scores. The present study examines the hypothesis of differential prediction by analyzing the extent to which DOB scale and factor scores are differentially related to the various leadership behaviors and behavioral dimensions of later OEC performance. Of 4,000 officers who took the DOB at entry on active duty, 900 went through the OEC exercise one to two years later, performing 5 technical, 5 administrative, and 5 combat-type tasks. Factor analysis of the OEC leadership performance records identified 30 behavioral factors specific to particular tasks. Factor analysis of marker variables representing the task-specific factors yielded 8 major behavioral dimensions, the two most important being combat leadership and technical/managerial leadership. Parallel DOB factor analyses produced 92 psychological factor scale scores and 17 major factorial dimensions of officer characteristics for validation against OEC performance. Differential prediction was achieved. In relating the 17 major DOB dimensions to the 8 major OEC dimensions, combat leadership performance at the OEC was well predicted only by the DOB combat leadership factor (.36), reflecting an outdoor/ combat/self-reliant pattern. In contrast, OEC technical/managerial leadership was best predicted by the DOB scientific potential and general knowledge factors, which also predicted OEC tactical staff and technical staff skills--all of these performances apparently requiring the same reasoning and organizing abilities. The best predictor of OEC technical staff skills, however, was the DOB mechanical technology factor (.40), which was not predictive of the other major OEC dimensions. The Technical Supplement to the report describes in detail the use of correlation of sums, based on tetrachoric intercorrelation coefficients, to relate the 92 scales and 17 factors of the DOB to the 30 task-specific and 8 cross-task factors of the OEC, and to total scores on the 15 task..

Measures taken from the DOB, and OEC-type assessment processes, are now being applied to ROTC cadets and junior officers.

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